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Front cover: The Ancient Tripolitanian amphora (left) and Tripolitanian 1 (right)

Back cover image: The Abbey Green site, Chester. Margaret Ward (then Margaret Bulmer) at work on the Roman pottery finds from the excavation trenches, seen here in the picture, in the summer of 1976 (photo: T.E. Ward, Chester City Council)

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Editorial

As with its predecessor, volume 16 carries papers on a variety of subjects from Britain and the Continent, ranging from papers dealing with production sites to those looking at the distribution of types. We again have a Reviews section. I thank the authors for their hard work. The Journal has a policy of double-refereeing prospective papers and both the Study Group Committee and I are very grateful to those expert readers who undertook to referee the work submitted to the Journal.

The papers have come to the Journal from various sources; some were in original form given as conference presentations, others are the result of research by students studying for degrees, three have been written as a result of the study of excavated assemblages. The Journal is dependent on the submission of quality articles via these types of avenues. Accordingly if you feel you have a prospective paper that might be suitable for the Journal do contact the editor to discuss the idea and format.

This volume carries obituaries for two members of the Study Group who made a huge contribution to archaeology and heritage through long dedicated careers. Charmian Woodfield and Don Mackreth were very keen members of the Group and over many years they invariably attended the Group's annual conferences. They occasionally gave papers to the annual gathering and to the East Midlands and East Anglia Regional Group meetings, at which they were often present. Both had broad interests amongst which the study of the Roman period and its pottery was to the fore. Their publications span a fifty year period, with Don's work in the early 1960s including research and reporting of details of the Roman fort at Broxtowe, Nottingham, while Charmian was, around that time, herself excavating at a number of sites and 'writing up'. Concerned with the detail of the evidence and the veracity of its interpretation Charmian and Don were very happy to argue a case; they championed causes and defended the historic environment when issues arose. Both were generous engaging personalities who greatly enriched our studies. Their numerous reports leave us an enduring record of their labours with high accomplishment readily apparent therein.

A few months after volume 15 of the Journal had gone to press we learned of the premature passing of our

member Alan Jacobs. Alan also had a wide set of interests in history and archaeology, especially finds and pottery from all periods, and he was an enthusiastic organizer of, and participant in, events involving the community. He served as a member of the Study Group Committee for a term and was one of the organizers of the annual conference held at Worcester in 2005. An appreciation of Alan by Jane Evans appeared in Newsletter 53. Another colleague who sadly passed away at a time when they were making a very strong contribution was the illustrator David Hopkins. Dave was particularly skilled in drawing pottery; he was able to capture perfectly even the roughest prehistoric handmade vessels or distorted wheelmade Roman forms. With his pencil he brought forth their character with care and empathy. He tackled many types of finds and could turn his hand to vivid reconstruction images. Many publications include his enriching artwork, especially site reports from the Midland counties. Roman studies have also lost Malcolm Todd, and just recently Sheppard Frere and David Peacock, three figures whose excavations and research resulted in the study and publication of a huge amount of Roman pottery, while they also supervised highly significant PhD studies in our subject. Members will know themselves the towering importance of Professor Frere's fieldwork, site monographs and reports, as well as his works of synthesis and discussion. It is anticipated that this Journal will include an obituary for David Peacock in its next volume.

I am grateful to Lloyd Bosworth (University of Kent) for his invaluable technical assistance with illustrative work, specifically in formatting, optimising and in some cases redrawing contributors' figures. His work will be apparent from some of the acknowledgements in the papers below. The Group thanks Oxbow Books, and in particular Julie Blackmore, for the page-setting and publication of this volume.

As we near the thirtieth anniversary of the first Journal, which appeared in 1986, it is worth recalling that it was steered into being by Rob Perrin on behalf of the Group with major inputs from Robin Symonds. It was produced originally by the Study Group but in time Oxbow published volume 2 and came to reprint volume 1; indeed Oxbow have since gone on to produce all but one of the volumes of

the Journal. That first volume included petrological studies, identification and assessment of imported fine wares in Britain, a paper on amphorae, and the Editorial noted the value of synthetic studies of distribution, contributions on methodology and a concern that full and proper publication of Roman pottery was being significantly squeezed – squeezed into microfiche or squeezed-out completely from reports. There was notice that the Journal aimed to include reviews and a call for shorter contributions on particular unusual pots of interest. Even a casual view of the contents of the present volume will note there is more than a thread of similarity in subject and focus of contributions in volumes 1 and 16; equally a reflection on the wider concerns of those studying and interested

in Roman pottery will perhaps lead to a realization that ‘squeeze’ has, in various guises and consequences, been with us a long time. At least through the pages of this Journal, dedicated to the subject, there is space for documenting and discussing, as was the original intention. For that to be sustained our community of interest needs to continue to answer the concluding call of the original Editorial of volume 1: ‘To succeed, texts are needed, so pens must be put to paper’. So do get typing your paper!

Up-to-date information on The Study Group for Roman Pottery, events and news, as well as details of previous volumes of this Journal and an archive of the Group Newsletters can be found at the Group’s website: <http://www.romanpotterystudy.org/>

*Steven Willis, February 2015
(with minor revision July 2015)*

Obituaries



Don Mackreth (left) with John Gillam (photo courtesy of John Peter Wild)

Donald Frederick Mackreth (1934–2014)

It was with great sadness that the Study Group for Roman Pottery learnt of the death of Don Mackreth in September 2014, a long-standing member of the SGRP. Born in Lichfield, Staffordshire, in 1934, he trained as a draughtsman after leaving Nottingham High School, and worked initially for the Coal Board. In the 1960s, however, he joined the excavations of Graham Webster at Wroxeter, came under his spell, and developed an interest in Roman pottery *inter alia*. Graham, as a former surveyor and one-time mature student himself, had a natural affinity to others with a similar background, and it was no surprise when Don registered for an arts degree at Leicester University in 1966. Graham remained his mentor and friend for the rest of his life.

On graduating in 1969, with a great deal of practical

experience under his belt and outstanding draughtsman's skills, Don was appointed Assistant Director of the Winchester Research Unit which was led by Martin Biddle. The Unit was then conducting urban excavations on a virtually unparalleled scale and, though he had counted himself as a Romanist, Don rapidly mastered the intricacies of medieval archaeology, and extended his expertise into medieval pottery.

In 1972 the Nene Valley Research Committee, which was facing the immense and growing challenge of the development of the Greater Peterborough New Town, took the decision to found its own archaeological field unit, and Don was appointed as its first Director. Adequate funding was in place from English Heritage and the local authorities, and in 1968 the RCHM had published an implications survey for the zone of development.

Nonetheless, Don had to hit the ground running, gather a supporting team of excavators and find and redesign an archaeological field centre. His wide experience and maturity gave him a great advantage, and he tackled with authority and success a range of sites from early prehistoric burials in the countryside to complex medieval and post-medieval urban stratigraphy in Peterborough city. He retained his interest in Roman pottery, attending SGRP conferences and in 1980 writing with Rob Perrin and Martin Howe the brief but essential *Guide to the Roman Pottery of the Nene Valley*.

Don was a perfectionist: this trait, which admittedly had its awkward aspects, ensured that his published output, reports on excavations, were of the highest standard. By 1988, however, the pace of development had slowed, concomitant funding for the Nene Valley Research Committee's activities dried up and the NVRC's unit had to close.

To his eternal credit, Don pressed on with the publication of his excavation backlog: his latest report, on the Orton Meadows Barrow, is in press. He also had time to pursue other interests. In 2005 he was appointed Peterborough Cathedral Archaeologist, which involved him in extensive investigation of the history and development of the Precinct and its architecture. The *Annual Reports of the Friends of Peterborough Cathedral* carried regular accounts of his surveys and discoveries.

Archaeologists working in Roman Britain as a whole had long recognised Don as the leading authority on Roman provincial brooches. He must have lost count of the multitude of specialist reports, couched in precise language and accompanied by superb drawings, which he had contributed to the *opera* of others. At last he had the opportunity to exploit the amazing index of brooches which he had built up over the years (now housed in the British Museum) and write two definitive volumes on *Brooches in Late Iron Age and Roman Britain*, published by Oxbow Books in 2011. The latter will be a vital resource for decades to come.

The photograph illustrating this appreciation highlights two of Don's principal areas of expertise: Roman pottery, personified here in John Gillam, and Real Ale – note Don's empty glass. He was also an expert on more modern ceramics and glassware, of which he had a significant collection. While at Leicester he met and married Christine whose quiet efficiency underpinned a great many of Don's activities and who presented him with two daughters, Miriam and Sophie. Those lucky enough to be invited to dinner *chez* Mackreth, particularly in their homes in the Nene Valley, enjoyed a memorable experience; for Don was an outstanding and extremely knowledgeable *chef de cuisine*. Declining health ultimately became a worry, but the acquisition of a mobility scooter enabled him still to frequent his local pub for a game of scrabble with his friends – and the odd pint.

He will be missed, not just in the pub, but by a wide circle of those who appreciated his immensely wide knowledge of so many facets of life and archaeology, and forthright opinions on the same.

John Peter Wild (with much assistance from Christine Mackreth and Geoffrey Dannell)



Charmian Woodfield at St Johns College during the annual Conference of the Study Group at Durham in 1994 (photo courtesy of Sue Wade)

Charmian Woodfield (1929–2014)

Charmian Woodfield, as with Don Mackreth, was a long standing and prominent member of the Study Group. Like Don she was an FSA and had a wide portfolio of interests and *causes* in archaeology and heritage, amongst which the study of the Roman period and its pottery was often foremost. As with Don, Charmian was a regular attendee of the Group's annual conferences, as well as meetings of the East Midlands and East Anglia Regional Group, which met twice a year through the late 1980s and early 1990s. Charmian served as a member of the Committee of the Study Group for a term between 1995 and 1998.

With her twin brother Nicholas, Charmian spent her early years at Market Harborough, Leicestershire, where her father ran a school. Charmian was an active field archaeologist from an early age. She dug at Verulamium with Sheppard Frere during his extensive exploration campaigns at the site and at other sites at that stage of her career, for she was one of the vanguard generation of itinerant diggers working for the Ministry of Works. This was at a time when it was less common for women to take a leading role in the field and she was a worthy pioneer in this respect. Her aptitude as an excavator was followed through into writing-up excavations and amongst the earliest of these will have been her contribution to the article on The Walls of Coventry (1963, *Transactions of the Birmingham Archaeological Society*). She was for some time archaeologist at the Herbert Museum, Coventry, where she resolutely campaigned to save the city's surviving historic buildings from redevelopment. Her skills as a field archaeologist and reporter were noted by Prof David Breeze in a tribute to her on the news of her passing 'In 1965 Charmian published in *Archaeologia Aeliana* her report on six excavations at turrets on Hadrian's Wall. In her meticulous excavation, the level of detail provided in the report and her analysis of all the evidence, Charmian set a new standard for the Wall. I was delighted when she came with her husband to the launch of the 14th edition of the Handbook to the Roman Wall, in which, I trust, I gave her work suitable recognition' (SALON Issue 329). A string of publications followed through the years: excavation monographs and reports, specialist pottery reports and reports of other finds. These were mainly focused on sites in Northamptonshire, Buckinghamshire and the Midland counties, and included the Roman site at Walton, Milton Keynes (1980, *Records of Buckinghamshire*, with Dennis Mynard), the palace of the Bishops of Lincoln at Lyddington (1982, *Transactions of the Leicestershire Archaeological and Historical Society*, with Paul Woodfield), publications on Roman Towcester and its associated pottery (volumes of *Northamptonshire Archaeology*), the Roman site at Stanton Low (1989, *The Archaeological Journal*), and *The Church of our Lady of Mount Carmel, Whitefriars, Coventry* (2005). In volume 12 of this Journal in 2005 she published an interesting article on 'Rare tazze, paterae and a broad hint at a *lararium* from *Lactodorum* (Towcester)'. In 2006 and after she worked with her husband Paul to bring the evidence of the early Roman kilns at Delapré Park, Northampton, to publication in *Northamptonshire Archaeology*.

Remembered for her colourful dress and energetic manner, Charmian had an eloquent way of speaking

which commanded attention. This attribute doubtless assisted in her advocacy of certain causes in the name of heritage, building conservation and funding for writing-up excavations. Rob Perrin noted in his tribute in the Spring Newsletter of the Study Group (2015, No. 59) how Charmian's dress style was 'individual, almost bohemian' and she had recollections and stories to match. Charmian will be remembered affectionately by those who knew her; she will be remembered for her commitment to archaeology and conservation, and, perhaps most strikingly for the fact that she 'had style'.

Members of the Study Group



Mark Wood discussing pottery at the annual Conference of the Study Group at Southampton in 1989 (photo courtesy of Sue Wade)

Mark Wood (1962–2011)

We take this opportunity to include a photo of Mark Wood whose passing was reported in volume 15 of the *Journal*.

Verulamium Region White Ware production at the Roman kiln site of Brockley Hill, Middlesex: a compositional and technological reassessment

Silvia Amicone and Patrick Sean Quinn

1. Introduction

The recent discovery of a Roman kiln site dated to the second century AD at Northgate House in the present day City of London (Seeley and Drummond-Murray 2005) has begun to alter the view of pottery production and distribution in and around Roman London. The kiln site at Northgate House (Fig 1a) produced a range of material, including sandy, light-coloured, functional pottery that closely matches Verulamium Region White Ware (VRW) (Fig 2). Production of this common Roman coarse ware was previously thought to have been restricted to workshops of the Verulamium region pottery industry, which was located between Stanmore and St. Albans, north-west of London (Fig 1a). However, evidence for the manufacture of pottery types resembling VRW within London clearly calls for a reassessment of this class of pottery and its circulation in Roman Britain (Fig 1b).

In the present study we revisit Brockley Hill (Fig 1a), the most extensively excavated kiln site of the Verulamium region pottery industry, and examine the production of its two main VRW outputs, mortaria and flagons (Fig 2). We apply a combination of thin section petrography and geochemical analysis to a large assemblage of sherds in order to investigate in detail the composition, raw materials and manufacturing technology of VRW at this important site. By analysing well-dated groups of pottery from numerous contexts at Brockley Hill we have characterised the compositional variability of VRW ceramics both within and between all five phases of operation of the kiln site. These signals have been interpreted in terms of possible technological, organisational and social phenomena related to Roman pottery production.

We have compared our data on Brockley Hill VRW with published analyses of macroscopically similar

pottery excavated from Northgate House (Tomber 2001; Vince 2002a; 2002b; Vince and Tomber 2005) in order to address the suspected links between these two workshops and identify possible characteristics that may be used to distinguish their respective products at other sites in Roman Britain.

2. Brockley Hill and the Verulamium Region Pottery Industry

Between *c* AD 50 and AD 170 a large pottery industry developed along Watling Street between Londinium and Verulamium (Fig 1a). The Romano-British kiln sites situated in this area, which are collectively referred to as the Verulamium region pottery industry, include Verulam Hills Field (Anthony 1968), Radlett (Castle 1974a), Little Munden (Saunders and Havercroft 1977) and Brockley Hill (Applebaum 1951; Castle 1972a). The Verulamium region industry manufactured Romanized shapes that were introduced in Britain after the Roman conquest. It quickly became one of the major suppliers of coarse pottery to London and other settlements in south-east England between the late first and early second centuries AD (Fig 1b) (Swan 1984, 97).

The principal products of the Verulamium region pottery industry were flagons and mortaria (Fig 2) but other forms such as bowls, lids, jars, lamps, amphorae and tazzas were also produced. The most common pottery type is Verulamium Region White Ware (VRW), which has a cream or off-white colour and a hard fabric characterised by a dense, clean clay matrix and abundant well-sorted quartz inclusions (Tomber and Dore 1998, 154). Other pottery types produced by the Verulamium region industry include Brockley Hill White-slipped Ware, Verulamium Region Grey Ware, Verulamium

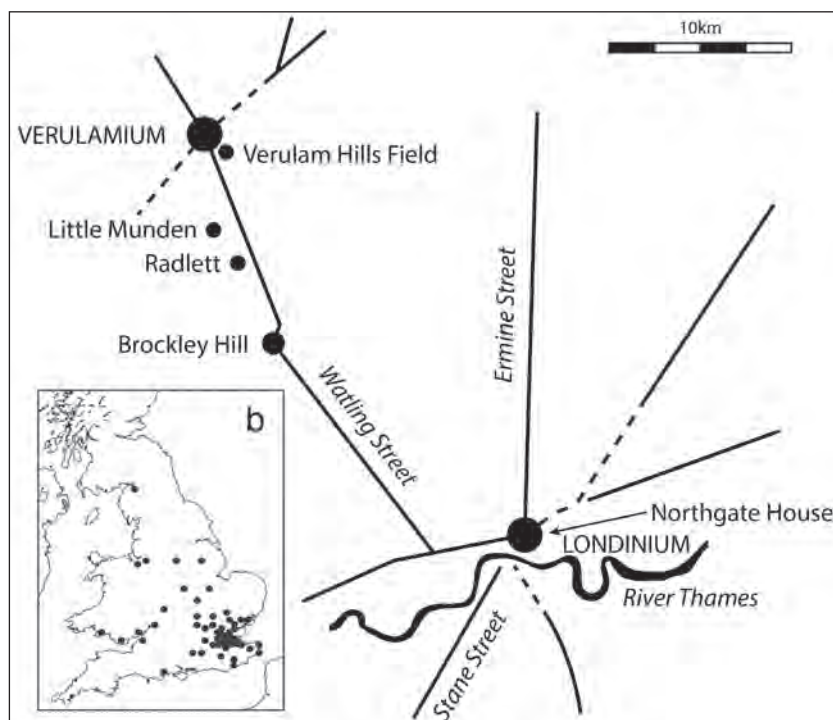


Fig 1. a). Location of workshops belonging to the Verulamium region pottery industry, including Brockley Hill, and the location of the kiln site of Northgate House in the Walbrook valley, London (modified from Seeley and Thorogood 1994, 224, fig 2); b). The known distribution of VRW pottery in Britain (modified from Tyers 1996, 201, fig 256)

Region Mica-dusted Ware, Verulamium Region Marble Ware and Verulamium Region Coarse White-slipped Ware.

One of the largest and most extensively excavated kiln sites within the Verulamium region pottery industry is Brockley Hill, situated near Stanmore on the north-western edge of present-day London (Figs 1a and Fig 3). Brockley Hill was excavated between 1937 and 1955 (Cottrill 1937; Richardson 1948; Applebaum 1951; Suggett 1954; 1955; 1956) and between 1968 and 1975 (Castle 1972a; 1972b; 1973a; 1973b; 1974b; 1975; 1976; 1978; Castle and Warbis 1973). Initial excavations attempted to determine whether Brockley Hill was the site of *Sulloniaca*, mentioned in the Antonine Itinerary, and to detect the location of Roman Watling Street in this area. They unearthed important groups of early Flavian pottery, including bowls, flagons, jars, amphorae and mortaria. The later excavations, which were undertaken in advance of the building of a hospital, encountered several kilns dating from different phases of pottery manufacture at Brockley Hill. These revealed that pottery was being produced from *c* AD 50 (pre-Flavian period) until *c* AD 150 (early Antonine period), when a drop in production appears to have taken place. It has been suggested that the discovery of stamped pottery in excavations from 1973 and 1975 (Castle 1975; 1976; 1978), provides evidence for the movement of potters between Brockley Hill and other Romano-British kiln sites (Swan 1984, 98).

Excavations in present day Moorgate, London, between 1999 and 2000 uncovered evidence for a second century AD Roman kiln site in what would have been the Upper Walbrook valley (Seeley and Drummond-Murray 2005). This appears to have manufactured a range of pottery including some Romanized styles such as VRW flagons and mortaria. The discovery of this site strongly implies that VRW was produced over a much wider area than previously thought. It calls for a reassessment of the supply of this common pottery type to London and other Roman settlements in Britain (Fig 1b).

3. Previous Analytical Studies of VRW

Pottery of the Verulamium region industry, particularly VRW, has been the subject of previous detailed compositional investigation (Devereux *et al* 1982; Tomber 2001; Vince 2002a; 2002b; Vince and Tomber 2005). Devereux *et al* (1982) analysed geochemically 92 VRW samples from the production sites of Brockley Hill, Verulam Hills Field, Radlett and Little Munden (Fig 1a) via X-ray fluorescence spectrometry. Their data revealed the existence of seven geochemical groups of VRW, which related well to the pottery of the different sites. This may be explained by the exploitation of specific local clay sources at the various sites within the Verulamium region pottery industry. The presence of three separate compositional groups among the sherds analysed from

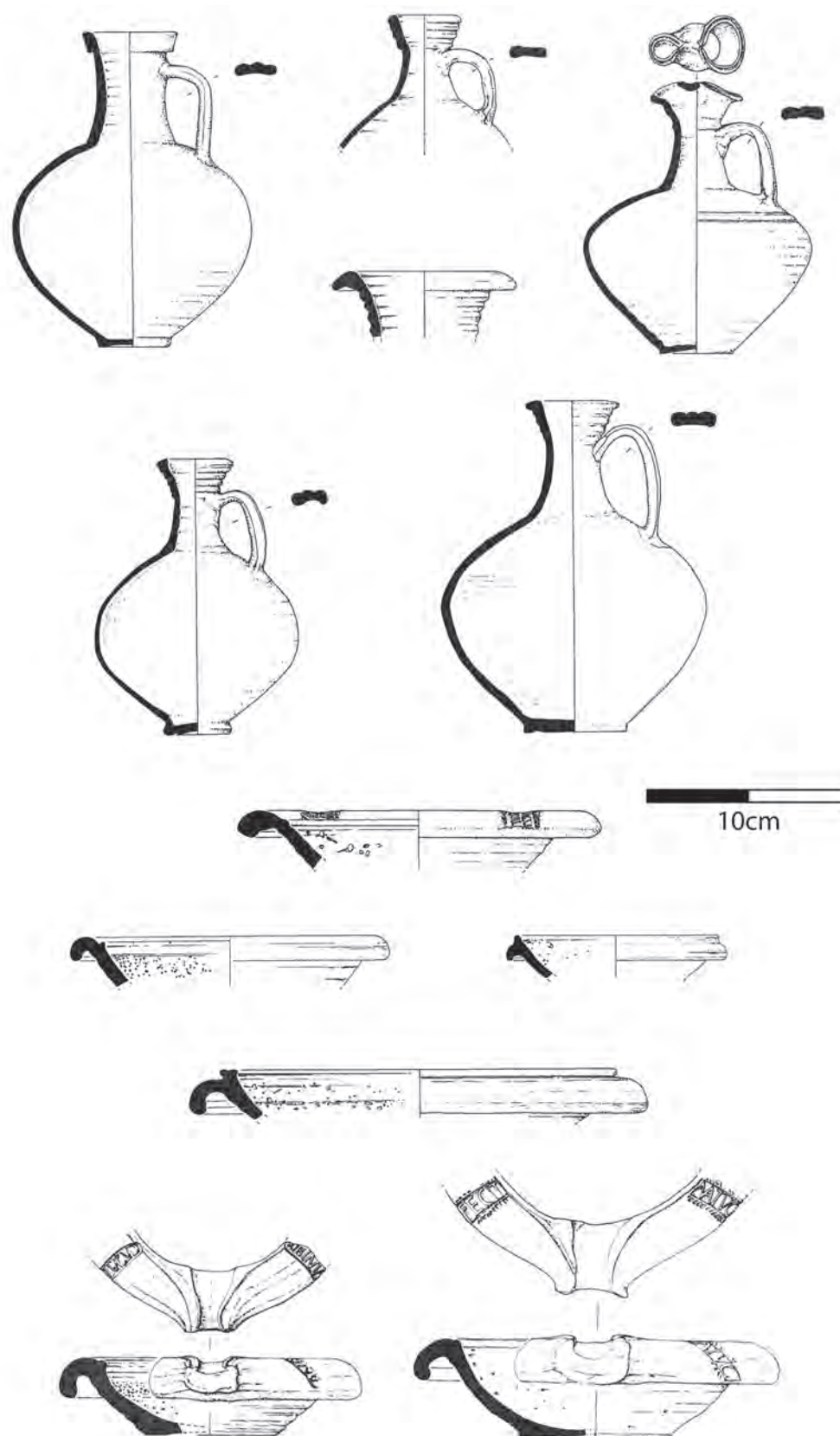


Fig 2. Pottery vessels of Verulamium Region White Ware: flagons (top) and mortaria (bottom), (modified from Davies et al 1994, 43–4, 49–50, figs 34, 35, 39 and 40)

Brockley Hill and two from Verulam Hills Field might also imply the existence of several clay paste recipes at single production sites that could be related to different vessel forms, the activities of specific potters and/or changes in pottery raw materials and technology over time. Unfortunately, the strictly geochemical approach taken by Devereux *et al* (1982) and the lack of temporal scale in their sampling strategy means that it is not possible to assess the likelihood of these possibilities.

In an attempt to investigate the link between the Verulamium region pottery industry and the newly discovered VRW production remains from the Upper Walbrook valley, Vince and Tomber (2005) (see also Tomber 2001; Vince 2002a; 2002b) compared samples of VRW from Northgate House and Brockley Hill both petrographically and geochemically. They were specifically interested in whether the close macroscopic similarity between the VRW ceramics of these two sites was due to the transportation of clay from Middlesex to London, the use of another similar light-firing clay source at Northgate House, or the result of clay preparation (Vince and Tomber 2005, 174). Fourteen VRW samples were analysed in thin section, five from Brockley Hill and nine from Northgate House (Tomber 2001). Sixteen VRW samples were also analysed via inductively coupled plasma mass spectrometry (ICP-MS), 11 from Brockley Hill and five from Northgate House. Other Roman pottery wares from Northgate House were included in their analysis, as well as samples of clay used for the lining of kilns at the two sites.

The analysis of Vince and Tomber (2005) indicated that most VRW samples from Brockley Hill and Northgate House were petrographically very similar, containing sand inclusions of a comparable composition. The majority of the samples also grouped together in a principal components analysis (PCA) scatterplot of the ICP-MS results (Vince and Tomber 2005, fig 181, 176), indicating their close geochemical composition. This suggested to Vince and Tomber (2005, 175) that 'a clay of exactly the same type as that used at Brockley Hill and quite likely to be from the same source' was used for the production of VRW at Northgate House. Nevertheless, several VRW samples from Northgate House were found to have a different chemical composition from the rest of the sherds. These could not be distinguished macroscopically or petrographically from the other VRW samples. However, Vince and Tomber (2005, 175) hypothesised that they were made with the addition of an unspecified, locally-sourced, red-firing clay. By re-examining their scatterplot, it is possible to see that three of the 11 VRW sherds from Brockley Hill also plot away from the main geochemical group. This supports the findings of Devereux *et al* (1982) that several compositional groups of VRW pottery exist at Brockley Hill. The same may be said for Northgate House VRW, suggesting that this class of pottery is not as compositionally homogeneous as previously thought.

With the above in mind, further compositional analyses are clearly required before it will be possible to distinguish between the products of Brockley Hill, Northgate House and other kiln sites producing VRW and understand the supply and demand of this important Roman pottery type. In the present study we have examined a large well-dated assemblage of sherds from Brockley Hill with the aim of reconstructing aspects of VRW production at this site. This dataset has also been used to further investigate the possible compositional and technological similarities and differences between Brockley Hill and Northgate House VRW that were highlighted by the previous analyses described above.

4. Sample Material and Analytical Methods

A total of 50 VRW sherds from Brockley Hill were subjected to detailed petrographic and geochemical analysis (Table 1). A sampling strategy was devised that covered the complete operational period of the kiln site (*c* AD 50–150) and the main VRW shapes that were produced. It was decided to concentrate on materials from the 1968–1975 excavations (Castle 1972a; 1972b; 1973a; 1973b; 1974a; 1975; 1976; 1978; Castle and Warbis 1973) due to their better contextual information. This material, which is housed at the London Archaeological Archive and Research Centre (LAARC), comes from six contexts that can be ascribed to five successive phases of the kiln site (Fig 3; Table 1). Some doubt surrounds the nature of Context 6 which is dated to the middle of the second century AD. It is not clear whether pottery was still being produced at this point in the early Antonine period.

Flagons and mortaria (Fig 2) were the dominant pottery forms produced at Brockley Hill in Roman times. Five representatives of each of these shapes were selected from each of the five phases (Table 1). This provided a framework within which to examine the composition and production technology of these two styles of pottery over time at the site. In the case of Phase 3, the mortaria and flagons come from different contexts (Table 1). Unfortunately, it was not possible to analyse samples of stamped pottery or relate the studied sherds to stamped pieces found at the site.

All samples were analysed by a combination of thin section petrography and bulk geochemistry. Standard 30µm thin sections were prepared from each sherd in a vertical orientation through the vessel wall (Whitbread 1996, 415, fig 1). These were examined under the polarising light microscope at magnifications of ×25–200 and studied in terms of the composition, shape and texture of their particulate inclusions, the nature of their clay matrix and the shape, size and arrangement of their voids. An attempt was made to group the thin sections into petrographic fabrics based on these visual observations (Quinn 2013, 73–9). The 50 thin sections were compared under the microscope with the Brockley

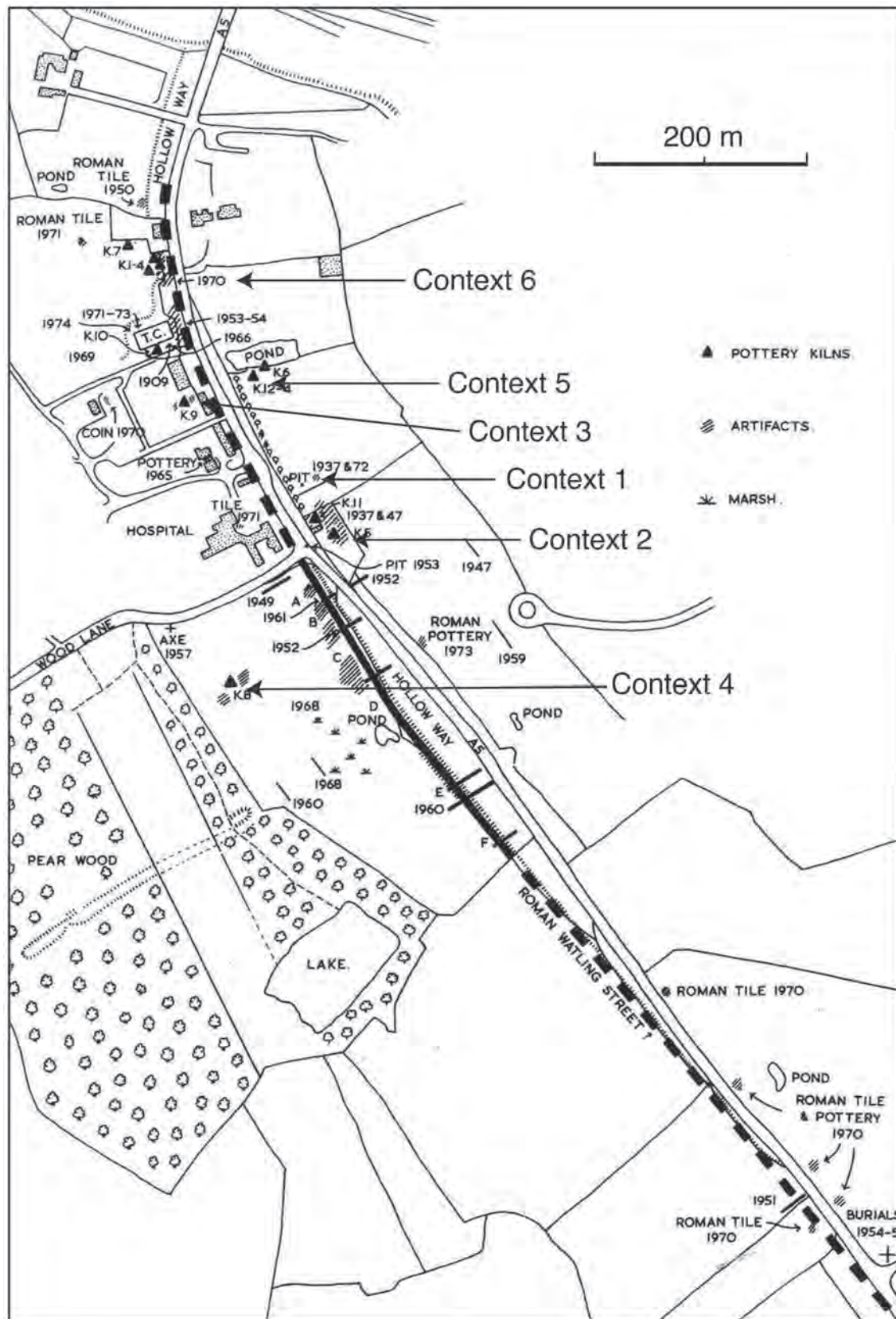


Fig 3. Plan of the Roman kiln site of Brockley Hill indicating the contexts from which the 50 VRW sherds analysed in this study (cf Table 1) originated (modified from Castle 1976, 207, fig 1)

Table 1. Details of the 50 VRW ceramic sherds analysed from Brockley Hill in this study.

Context No.	Details	Sampled Form	Phase	Period
6	Site A 1970: Layers 3 and 3a	5 Flagons, 5 Mortaria	5	
5	Site C: Kiln 2	5 Flagons, 5 Mortaria	4	Early second century – Antonine (<i>c</i> AD 97–160)
4	Kiln 8: Kiln ditch	5 Flagons		
3	Doinus Kiln: Furnace infill	5 Mortaria	3	
2	Site A: Trench 1, pit layer 2	5 Flagons, 5 Mortaria	2	Flavian (<i>c</i> AD 69–96)
1	Site B: Trench 2, pit	5 Flagons, 5 Mortaria	1	Pre-Flavian (<i>c</i> AD 50–69)

Hill and Northgate House VRW thin sections analysed by Tomber (2001) and Vince and Tomber (2005) to ascertain their petrographic similarities and differences.

Due to the homogeneous, quartz-rich, nature of the Brockley Hill VRW samples, visual classification into well-defined fabrics was challenging. For this reason, quantitative petrographic data was also collected from the 50 thin sections, including the relative abundance of inclusions, matrix and voids, as well as the composition and size of the inclusions. Modal and textural data were collected using a point counting device connected to the polarising light microscope (Quinn 2013, 102–11). A total of 100 points were counted per thin section using the single-intercept method and a spacing of 1mm, which was roughly equivalent to the size of the largest inclusions in the samples. The raw quantitative data were analysed statistically to determine the relative abundance of specific classes of inclusions as well as textural parameters including the mode, mean, standard deviation and grain size distribution of the inclusions (Table 2).

All VRW sherds were also analysed geochemically via energy dispersive X-ray fluorescence (ED-XRF) using a subsample *c* 8g in weight. The surface of each sample was cleaned with a tungsten carbide drill bit to remove possible contaminants. It was then crushed to a fine powder in a percussive ball mill, dried overnight at 110°C and pressed into a disc with 0.9g of binding wax at a pressure of 15 tonnes. The pressed pellets were analysed with a ‘Spectro X-Lab 2000’ ED-XRF to determine the abundance of 50 elements. All elements were calculated as oxides by stoichiometry. Major elements were expressed as weight percent and minor and trace elements were recorded as parts per million (ppm). The accuracy and precision of the ED-XRF analysis were determined by running two certified reference materials ‘NBS 679 Brick Clay’ and ‘SARM 69 Ceramic 1’. Elements with an abundance below the limits of detection of the machine (*c* 20ppm) were disregarded before submitting the geochemical dataset to multivariate statistical analysis.

Principal components analysis (PCA) was employed to detect possible geochemical groups within the 50 VRW samples that might be of archaeological significance.

The results of the visual petrographic grouping, the quantitative analysis of inclusions and the geochemical classification of the samples were compared to one another, as well as with information on the shape of each sherd (flagon or mortarium) and the phase of operation of Brockley Hill from which it came.

In order to identify the possible sources of clay and temper used for the production of VRW at Brockley Hill, a program of raw material prospection and analysis was carried out in the landscape surrounding the site. Using a geological map and accompanying reports (Sumbler 1996) as a guide, attempts were made to identify and sample specific deposits of clay, rock and sand that form the Cretaceous and Tertiary bedrock of the area (Fig 4). Particular efforts were made to sample the ‘light firing clay’ referred to by Vince and Tomber (2005, 175). Due to extensive modern development in this part of London it was not always possible to access the underlying geology. A total of nine field samples were collected (Fig 4; Table 3) and processed in the laboratory. Eight clay-rich samples were dried, crushed, sieved, wetted, formed into briquettes and fired at 900°C for one hour in an electric kiln. A single sandy sample of possible temper was mounted in epoxy resin. All field samples were thin sectioned and compared with the VRW ceramics under the microscope in order to identify matches.

5. Petrographic and Geochemical Composition of Brockley Hill VRW

The 50 thin sections of VRW analysed from Brockley Hill are characterised under the microscope by the presence of equant and elongate, sub-angular to rounded, coarse sand to coarse silt-sized mono- and polycrystalline quartz inclusions, plus less frequent inclusions of chert, feldspar, white mica and opaque minerals (Fig 5). Significant variation exists in terms of the abundance, sorting and size of the quartzose inclusions, with some samples characterised by abundant coarse silt and fine sand-sized inclusions (Fig 5a) and others by less abundant medium sand-sized inclusions (Fig 5b). The clay matrix

Table 2. Quantitative thin section petrographic data on the 50 VRW ceramic sherds analysed from Brockley Hill in this study. Samples are arranged by phase of operation of the kiln site and vessel shape (F: flagon; M: mortarium).

Sample	Shape	Phase	Total Inc.	Quartz	Poly-quartz	Chert	Clay Pellets	Maximum	Mean	Mode	Standard Deviation
BHC001	M	1	27	92.6	7.41	0	0	0.44	0.26	0.28	0.095
BHC002	M	1	27	92.6	7.41	0	0	0.48	0.24	0.16	0.123
BHC003	M	1	35	97.1	0	0	2.86	0.8	0.27	0.28	0.143
BHC004	M	1	19	89.5	10.5	0	0	0.6	0.31	0.28	0.118
BHC005	M	1	33	97	3.03	0	0	0.56	0.24	0.16	0.133
BHC006	F	1	30	100	0	0	0	0.64	0.25	0.12	0.141
BHC007	F	1	26	92.3	3.85	0	3.85	0.4	0.22	0.16	0.094
BHC008	F	1	43	100	0	0	0	1	0.31	0.28	0.162
BHC009	F	1	52	88.5	11.5	0	0	0.48	0.24	0.28	0.110
BHC010	F	1	34	100	0	0	0	0.6	0.3	0.28	0.146
BHC011	M	3	45	93.3	6.67	0	0	0.56	0.25	0.28	0.107
BHC012	M	3	39	94.9	5.13	0	0	0.52	0.17	0.12	0.101
BHC013	M	3	34	94.1	5.88	0	0	0.52	0.23	0.2	0.097
BHC014	M	3	36	91.7	5.56	0	2.78	0.6	0.29	0.4	0.128
BHC015	M	3	48	97.9	2.08	0	0	0.48	0.22	0.2	0.094
BHC016	F	2	21	100	0	0	0	0.48	0.27	0.32	0.103
BHC017	F	2	9	100	0	0	0	0.32	0.2	0.2	0.09
BHC018	F	2	25	96	4	0	0	0.48	0.25	0.16	0.10
BHC019	F	2	28	96.4	3.57	0	0	0.4	0.27	0.4	0.107
BHC020	F	2	28	96.4	0	3.57	0	1	0.26	0.28	0.172
BHC021	M	2	50	100	0	0	0	0.68	0.26	0.28	0.117
BHC022	M	2	42	100	0	0	0	0.56	0.27	0.2	0.115
BHC023	M	2	46	95.7	4.35	0	0	0.68	0.24	0.28	0.110
BHC024	M	2	43	97.7	2.33	0	0	0.48	0.25	0.28	0.097
BHC025	M	2	26	96.2	3.85	0	0	0.52	0.27	0.2	0.109
BHC026	M	4	41	100	0	0	0	0.48	0.2	0.12	0.085
BHC027	M	4	55	100	0	0	0	0.48	0.25	0.28	0.089
BHC028	M	4	40	95	5	0	0	0.4	0.22	0.24	0.07
BHC029	M	4	56	94.6	5.36	0	0	0.52	0.23	0.2	0.091
BHC030	M	4	49	100	0	0	0	0.64	0.25	0.12	0.131
BHC031	F	4	38	92.1	7.89	0	0	0.64	0.34	0.4	0.108
BHC032	F	4	25	96	4	0	0	0.6	0.21	0.24	0.134
BHC033	F	4	28	96.4	3.57	0	0	0.52	0.22	0.08	0.134
BHC034	F	4	29	100	0	0	0	0.52	0.24	0.28	0.101
BHC035	F	4	11	100	0	0	0	0.32	0.22	0.2	0.068
BHC036	F	3	31	96.8	3.2	0	0	0.48	0.18	0.12	0.09
BHC037	F	3	47	100	0	0	0	0.8	0.26	0.28	0.145
BHC038	F	3	40	98	3	0	0	0.44	0.24	0.24	0.092
BHC039	F	3	55	100	0	0	0	0.48	0.25	0.28	0.080
BHC040	F	3	44	95.5	4.55	0	0	0.52	0.2	0.28	0.103
BHC043	M	5	48	89.6	10.4	0	0	0.4	0.19	0.12	0.079
BHC044	M	5	53	96.2	3.77	0	0	0.32	0.15	0.12	0.069
BHC045	M	5	45	97.8	2.22	0	0	0.48	0.17	0.08	0.125
BHC046	M	5	52	100	0	0	0	0.28	0.11	0.12	0.062
BHC047	M	5	42	100	0	0	0	0.4	0.12	0.08	0.088
BHC048	F	5	46	93.5	6.52	0	0	1	0.25	0.12	0.175
BHC049	F	5	29	100	0	0	0	0.48	0.27	0.16	0.108
BHC050	F	5	43	100	0	0	0	0.2	0.09	0.08	0.042
BHC051	F	5	35	100	0	0	0	0.52	0.2	0.08	0.128
BHC052	F	5	41	95.1	4.9	0	0	0.48	0.2	0.12	0.095

is generally light-coloured (Fig 5c), but in numerous samples can be more reddish (Fig 5d) and intermediate shades exist between these two extremes. Many samples contain distinctive red streaks and clay pellets (Fig 5e), grey-black mottling that stands out against the otherwise

light-coloured clay matrix (Fig 5f), as well as iron-rich nodules (Fig 5g). The samples have variable porosity with some almost lacking in voids and others containing large vughs and elongate voids that can be aligned to the margins of the parent vessel (Fig 5h).

The gradational nature of the variation in the Brockley Hill VRW ceramics in thin section means that end members can appear petrographically and texturally quite different (Fig 5a–d), but are linked by thin sections with a continuous range of intermediate compositions. With the exception of several samples with more abundant, silt-sized inclusions, rare white mica and a more reddish clay matrix, that includes BHC043, 044, 045, 046, 047, 048, 050 and 052 (Figs 5a and 6g), this variation makes the assemblage difficult to sub-divide into meaningful petrographic groups using a qualitative, visual approach. With this in mind, the quantitative point-count data collected from all thin sections (Table 2) provides a more accurate means of detecting and characterising compositional patterns in terms of the abundance and size of inclusions in the VRW sherds.

Based on a count of 100 points per thin section, the proportion of inclusions varies from as low as 9% to a maximum of 55% (Table 2). All samples were dominated by monocrystalline quartz, which accounts for 90% or more of the inclusions encountered. In addition, low but significant numbers of polycrystalline quartz inclusions (<10%) and less frequent clay pellets and chert (<5%) occur in some samples.

The mean (0.09–0.34mm) and modal inclusion size (0.08–0.32mm), as well as the standard deviation (0.04–0.18 mm), differ significantly between samples (Fig 7), confirming the textural variability detected visually (Figs 5 and 6). Comparing these data to the shape of each sherd (flagon or mortarium) and the phase of operation of Brockley Hill from which it came reveals some interesting patterns (Table 2). For example, mortaria from Phase 1 (pre-Flavian period) (Fig 5c) and flagons from Phase 2 (Flavian period) (Fig 5d) contain less inclusions than the other samples, whereas mortaria from



Fig 4. Simplified geological map of the area surrounding Brockley Hill with the location of the nine field samples of potential ceramic raw materials collected for comparison with the VRW sherds in this study

Table 3. Details of the nine field samples of potential ceramic raw materials collected in the region around Brockley Hill and compared with the VRW sherds in this study. For the location of the samples see Fig 4.

Field Sample	Location	Geological Deposit	Description
1	Ditch cut on A5	London Clay Formation	Grey clay
2	Fallen tree	Stanmore Gravel Formation	Loose sand and gravel
3	Ditch cut on Wood Lane	Claygate Member	Grey clay
4	House foundations	London Clay Formation	Grey clay
5	Disused brick pit	Lambeth Group	Light-coloured clay
6	Disused brick pit	Lambeth Group	Light-coloured clay
7	Ditch cut on A5	London Clay Formation	Yellowish clay
8	Ditch cut on A5	London Clay Formation	Yellowish clay
9	River bank	Recent alluvium	Grey clay

Phase 5 (early Antonine period) (Figs 5a and 6g) have more inclusions. The dominant (modal) inclusion size in the samples (Table 2) reveal that mortaria and flagons from Phase 5 also have a particularly fine overall grain size due to a greater proportion of silt-sized inclusions (Figs 5a and 6g).

Of the 50 elements recorded by ED-XRF analysis, Ag, As, Bi, Br, Cd, Cs, Ge, Hf, Hg, I, In, Mo, Se, Sn, Sb, Ta, Te, Th, Tl and U were present in abundances that are below the limits of detection of the machine and were therefore left out of subsequent statistical analyses. The elements Co and W were not included due to potential contamination from the drill bit used to clean the samples. The elements Ba, Cl, P and S were left out as they can be affected by post-depositional alteration of ceramics. The measurement of Na was deemed to be too inaccurate for inclusion in the statistical analysis.

The concentration of the remaining 23 elements (Table 4) provides a detailed geochemical picture of VRW produced at Brockley Hill. All samples contain abundant silica (SiO_2), which derives mainly from the quartzose inclusions in the ceramics and varies according to the proportion of this aplastic material from *c* 65% (eg Sample BHC017, Fig 5d) to *c* 80% (eg Sample BHC029, Fig 6a). The next most abundant component is alumina (Al_2O_3), which makes up *c* 15–30% of the bulk composition of the ceramics and mainly reflects differences in their clay mineral chemistry. Samples with the highest alumina are characterised by light-firing clay matrices (eg Sample BHC005, Fig 5c) and those with the lowest levels have a more reddish clay fraction (eg BHC046, Fig 6g). The proportion of iron (III) oxide (Fe_2O_3) varies from *c* 1.5–5% and affects the colour of the clay fraction of the ceramics in an opposite manner, with the iron-rich samples having darker, more reddish matrices (eg Sample BHC035, Fig 5e) and the relatively iron-poor VRW being characterised by lighter coloured clay (BHC029, Fig 6a). Lime (CaO) constitutes <1% of all samples, which is in keeping with the samples' non-calcareous clay matrices and the absence of carbonate inclusions or calcium-bearing feldspars. Other minor elements include K_2O , TiO_2 and MnO . Elements detected in trace quantities (<0.1%) in the VRW ceramics include Ba, Ce, Cr, Cu, Ga, La, Nb, Ni, Rb, St, V, Y, Zn and Zr.

In order to classify the 50 VRW sherds based on their elemental composition and detect possible geochemical groups the dataset of 23 elements was subjected to multivariate statistics via PCA. The extreme dominance of silica in the samples means that variation in this compound, which is related to abundance of quartzose inclusions in the samples, is likely to exert a strong dilution effect on the relative proportion of the other elements (Baxter and Freestone 2006, 524). In an attempt to compensate for this effect, the data were initially log-transformed prior to statistical classification. However, important compositional patterning that was discovered by

performing PCA on the normalised, non-log transformed data (Fig 8) was not visible, so log-transformation was not used in the final classification of the samples.

A scatterplot of first two principal component scores for the 50 VRW samples reveals three compositional groupings, as well as one outlier (Fig 8a; Table 4). A factor plot of the contribution of each of the 23 elements to the first two principal components (Fig 8b), confirms the strong influence of silica on principal component 1, as well as the negative correlation of numerous other elements, including Al, Cr, K, Rb and Sr, with Si. Several trace elements including Ce, Ga, La and Y are also significant for the classification of the samples, particularly for the separation of the sherds in chemical group 3 (Fig 8f).

Groups 1 and 2 do not exhibit any clear relationship to either the vessel shape of the samples (Fig 8c), nor the phase of Brockley Hill from which they came (Fig 8d). However, it is worth noting that the four samples that constitute chemical group 3 are all flagons from phase 4 of the site.

The 50 VRW thin sections were re-examined in the light of the geochemical classification. Chemical group 1 contains the eight VRW sherds with abundant silty inclusions and a reddish clay matrix (Figs 5a and 6g). However, other samples that are petrographically quite different to these were also classified in this group (eg Figs 5b and 6a). Chemical group 2 is equally diverse in thin section (eg Fig 5c, h and g). The four samples that constitute chemical group 3 all have a reddish clay matrix with streaking and/or pellets, as well as sparse medium sand-sized quartzose inclusions (Fig 5e). While they are petrographically closely related to one another, red streaking is also present in some samples classified in chemical group 2. The distinctive dark mottling (Fig 5f) is present in samples belonging to all three chemical groups, perhaps suggesting that it may represent some sort of contamination during thin section preparation. Sample BHC017, which represents an outlier in the PCA plot in Fig 8a is characterised by a reddish clay matrix and only very sparse sand inclusions (Fig 6d). In this latter respect it is unlike the other 49 VRW samples analysed.

A comparison between the quantitative point count data and the geochemical groupings reveals the strong influence of the abundance of quartzose inclusions on the chemical classification of the samples (Fig 8e). All but one of the sherds within chemical group 1 contain >31% of inclusions, whereas all the samples classified in chemical group 3 and most of those in chemical group 2 have 11–30% inclusions. The outlier sample BHC017 has the lowest percentage of inclusions which is in keeping with its position on the plot in Fig 8e. The abundance of silica in the VRW sherds and therefore the proportion of inclusions, is the main difference separating samples classified in chemical groups 1 and 2.

The four sherds classified as chemical group 3

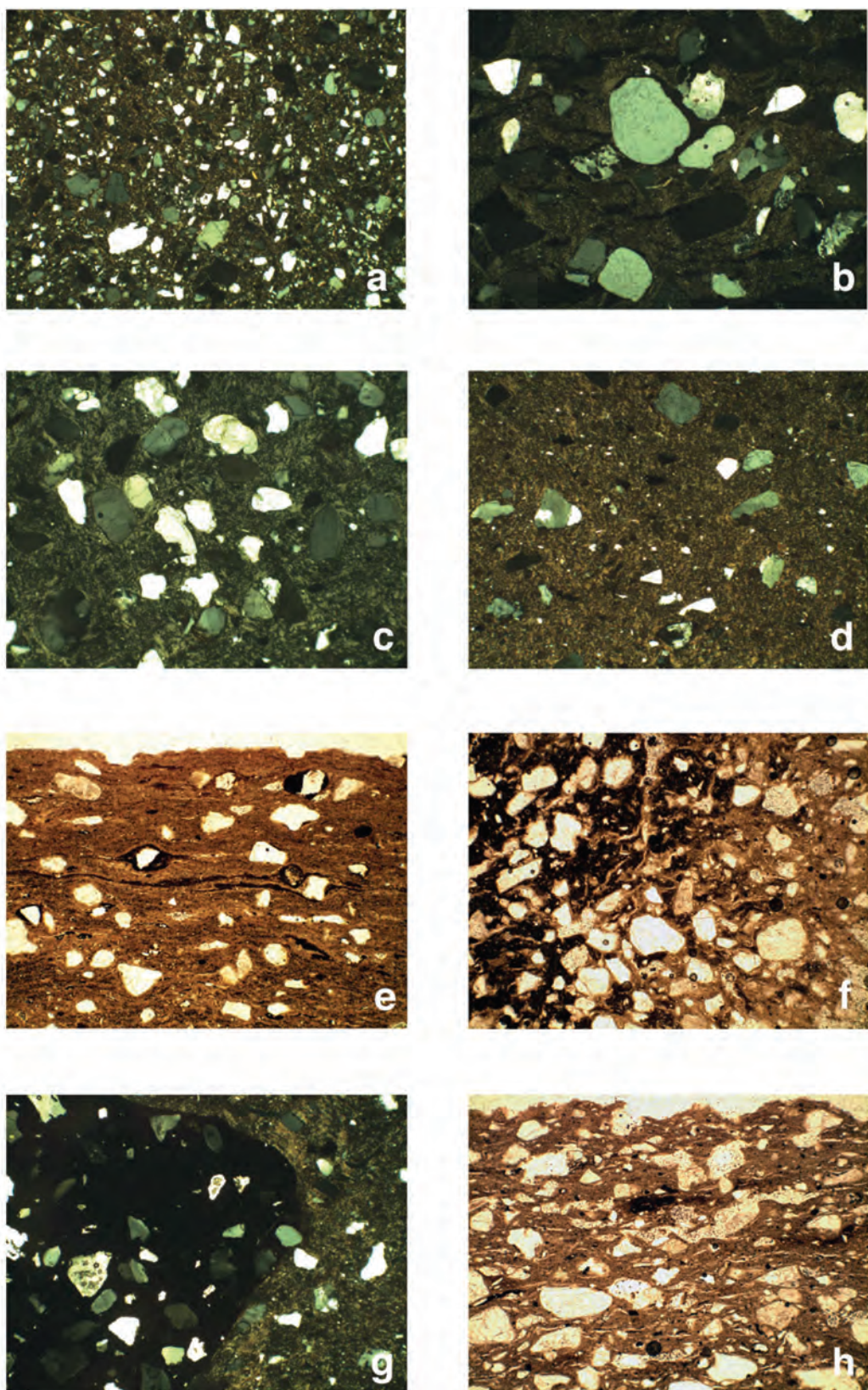


Fig 5. Thin section photomicrographs of selected VRW ceramics from Brockley Hill analysed in this study: a) BHC047 with abundant silt-sized inclusions; b) BHC031 with sparse medium sand-sized inclusions; c) BHC005 with light-coloured clay matrix; d) BHC017 with red-coloured clay matrix; e) BHC035 with distinctive red streaking in its clay matrix; f) BHC036 with dark mottling in its clay matrix; g) BHC020 with large iron rich nodule containing quartz clasts; h) BHC051 with elongate voids aligned parallel to the margin of the sherd. Images A–D and G taken in crossed polars and images E, F and H in plane polarised light. Image width = 2.9mm

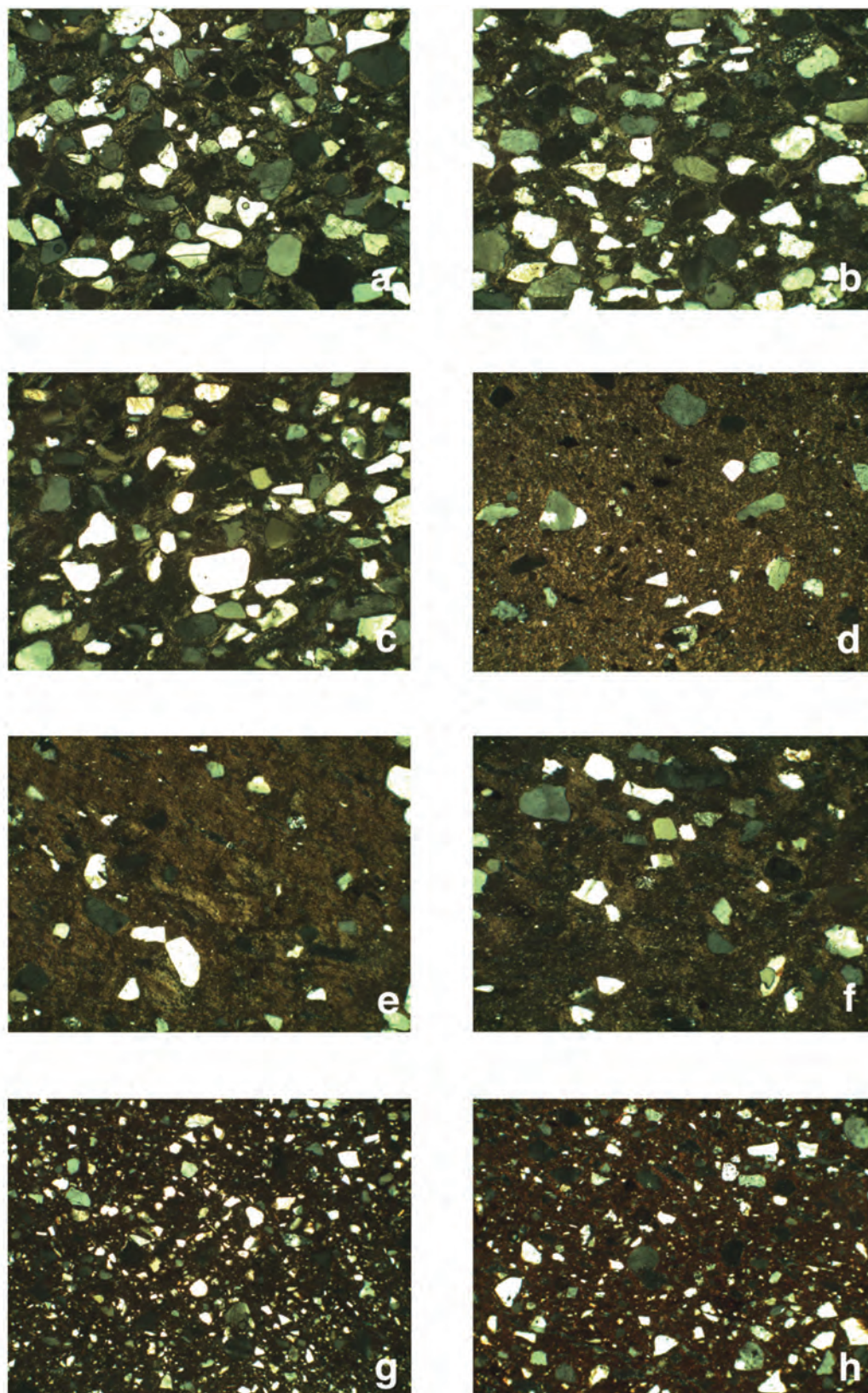


Fig 6. Thin section photomicrographs of selected VRW ceramics from Brockley Hill analysed in this study (a, d and g), alongside Brockley Hill (b and e) and Northgate House (c, f and h) VRW ceramics previously analysed by Tomber (2001) and Vince and Tomber (2005) illustrating close petrographic matches between the VRW ceramics of the two Roman kiln sites: a) BHC029; b) RTS562; c) RTS609; d) BHC017; e) RTS566; f) RTS610; g) BHC046; h) RTS533. All images taken in crossed polars. Image width = 2.9mm

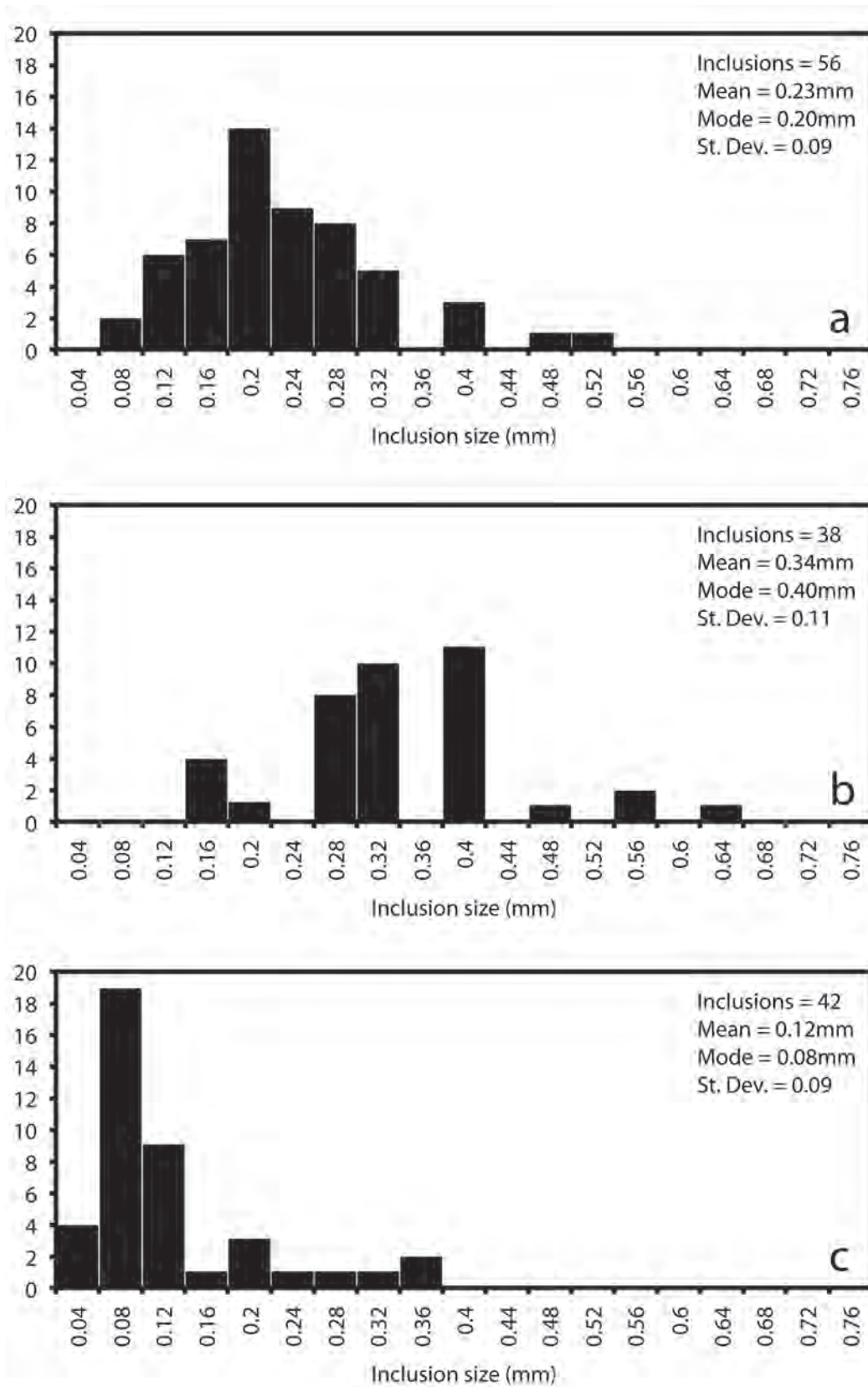


Fig 7. Grain-size distribution histograms of textural data from selected VRW ceramics analysed from Brockley Hill in this study. Data collected via point counting 100 points on each sample under the polarising light microscope (Table 2). Total number of inclusions counted, mean and mode inclusion size and standard deviation given for comparison: a) BHC029 (Fig 6a); b) BHC031 (Fig 5b); c) BHC047 (Fig 5a)

(BHC032, 033, 034 and 035) are defined by their greater abundance of Ce, Fe, La and Y compared to the other 46 analysed samples. This is visible in scatterplots of these elements (Fig 8f). The presence of red streaking in these sherds (Fig 5e), all of which originated from Phase 4, might suggest that intentional clay mixing is responsible for their unique chemical signature. Though it is worth noting that similar features also occur in other Brockley Hill VRW samples.

6. Comparison with Previous Analytical Studies

Petrographically, the 50 ceramic samples in this study are comparable to the five VRW thin sections from Brockley Hill analysed by Vince and Tomber (2005; see also Tomber 2001) and some close matches exist (Fig 6). These previously analysed samples are also characterised by quartz-rich sand temper in a light-coloured (Fig 6b) or more reddish (Fig 6e) clay matrix. As with the 50 samples analysed here, significant variation exists in terms of the size and abundance of the sand inclusions as well as the colour and texture of the matrix. Only two of the five samples have a light-firing clay matrix that is thought to be characteristic of VRW (Fig 6b). Ceramics with the more silty, red-firing composition detected in this study (Fig 4g), were not represented in Brockley Hill samples analysed by Vince and Tomber (2005). Mottling was present in the clay matrix of several samples and one contains some red clay-rich features. One sample contains probable grog temper that was not seen in the VRW samples analysed here.

The nine VRW thin sections analysed by Vince and Tomber (2005) from Northgate House also exhibit similar petrographic variation that overlaps with that of Brockley Hill and includes some good compositional matches (Fig 6). As at Brockley Hill, not all the VRW samples are characterised by a light-firing clay matrix. The reddish-firing silty composition detected in the 50 VRW ceramics in this study is present in these previously analysed VRW thin sections from Northgate House (Fig 6h). Grog temper is present in one sample, though this occurs in a compositionally different fabric from the Brockley Hill sample of Vince and Tomber (2005) mentioned above.

In their geochemical classification of 16 VRW samples from Brockley Hill and Northgate House, Vince and Tomber (2005; see also Vince 2002a; 2002b) revealed that the ceramics from both sites exhibit compositional variability. Unfortunately, it is not possible to classify statistically the elemental composition of the 50 sherds of VRW from Brockley Hill determined by ED-XRF in this study, alongside the ICP-MS data on the 16 contemporaneous ceramic samples obtained by Vince and Tomber (2005). However, by comparing the average abundance of specific elements in the two datasets (Table 5) it is possible to see that the VRW ceramics in

this study have a close chemical composition to those analysed by Vince and Tomber (2005) from Brockley Hill and Northgate House. Comparisons between specific samples which are petrographically related in thin section (Fig 6) indicate that they also have similar elemental compositions for most major and minor elements (Table 5). Differences in the accuracy of the two geochemical datasets may be responsible for discrepancies in the abundances of certain trace elements.

Unfortunately, Devereux *et al* (1982) did not publish the elemental data from their XRF analysis of 92 VRW samples from Brockley Hill, Verulam Hills Field, Radlett and Little Munden, so it is not possible to compare this to the geochemical characterisation of Brockley Hill VRW in the present study.

7. Ceramic Raw Materials and Paste Preparation

The petrographic and geochemical variability within the 50 VRW sherds from Brockley Hill that has been revealed in this study (Figs 4, 5 and 8) may have several possible sources. Naturally occurring sedimentary deposits, exploited for ceramic production can contain significant variation in composition and texture (Hein *et al* 2004; Travé Allepuz *et al* 2014) and it is possible that some of the differences between the sherds can be ascribed to this. In addition, ceramic paste recipes are intrinsically variable and may be subject to fluctuations over time, especially if they are prepared by the admixture of several ingredients (Arnold *et al* 1991; Buxeda I Garrigós *et al* 2003). Given that the sherds analysed were produced over a c 100 year period it is possible that such an effect is also responsible for the compositional diversity of the analysed samples. Notwithstanding these influences certain clear compositional differences that are visible in thin section (Fig 5) and within the geochemical dataset (Fig 8) are likely to be due to the use of several raw materials sources for VRW production at Brockley Hill, as well as different methods of paste preparation. For example, ceramics characterised by rounded sand-sized inclusions and light-coloured clay matrix (Fig 5b) and those with a redder clay fraction and abundant silt sized-inclusions (Fig 5a) were clearly not produced using a single source of clay.

In order to identify the various types of raw materials used in the manufacture of VRW at Brockley Hill and identify their origins it is first necessary to consider the possible methods of paste preparation employed by potters at the site (Quinn 2013, 154–71). Certain analysed samples were almost certainly produced by the addition of sand-sized quartz-rich particulate temper to a fine light-firing clay source (Fig 5b and c), resulting a bimodal grain size distribution (Fig 7b). Vince and Tomber (2005) also speculated that sand temper could have been used for the production of VRW, pointing out

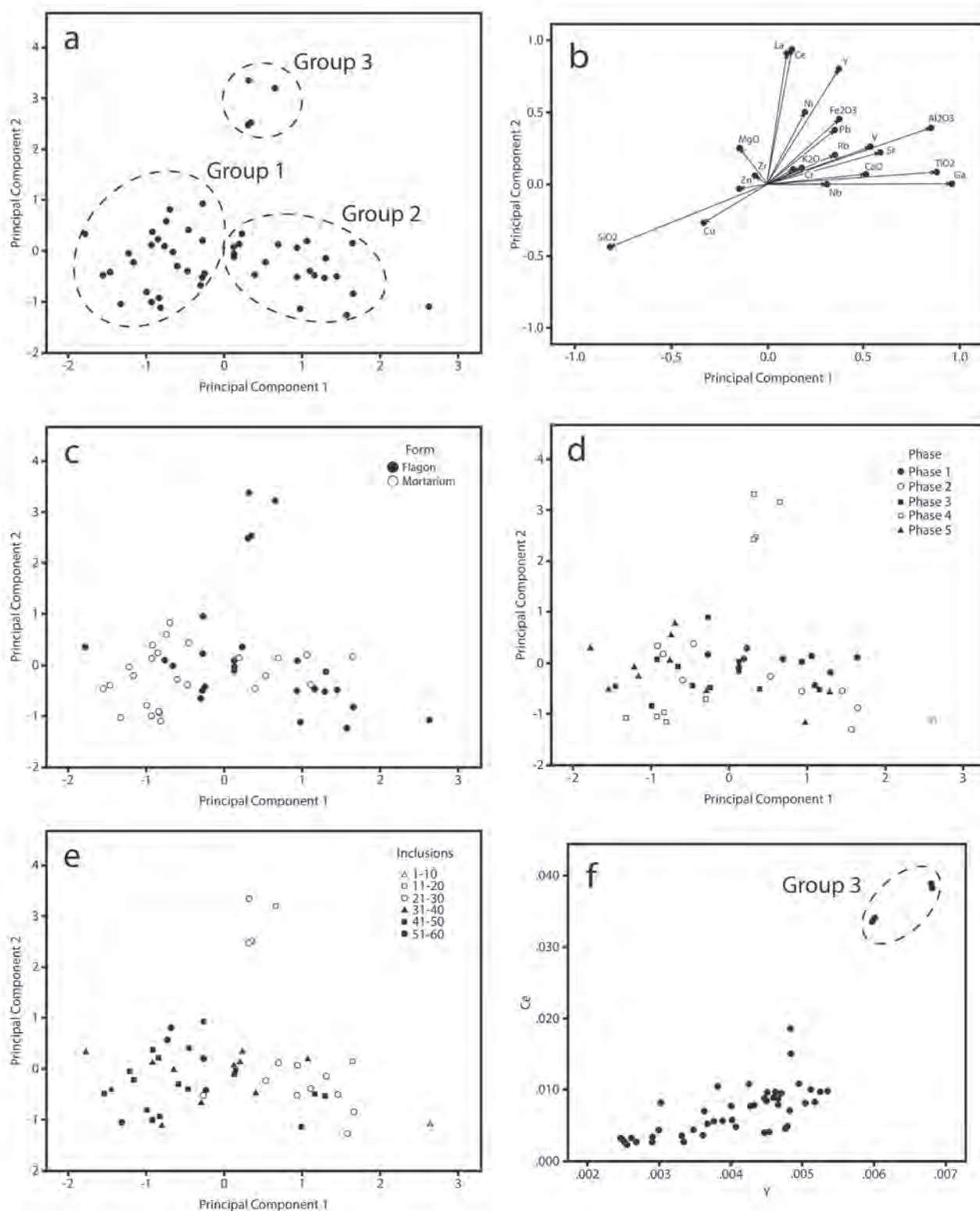


Fig 8. Results of the PCA classification the 50 VRW ceramic sherds from Brockley Hill analysed in this study, based on the normalised abundance of 23 major, minor and trace elements: a) Scatterplot of principal components 1 and 2 with chemical groups indicated; b) Factor plot of the influence of each of the 23 elements used in the PCA; c) Scatterplot of principal components 1 and 2 with vessel shape for comparison; d) Scatterplot of principal components 1 and 2 with site phase for comparison; e) Scatterplot of principal components 1 and 2 with abundance of inclusions (%) for comparison; f) Scatterplot of Ce against Y, with chemical group 3 indicated for plot of ceramics and clay samples

fine white-coloured London Eggshell Ware and London Marbled Ware from Northgate House is characterised in thin section by light-firing clay without sand inclusions.

The distinctive silty, micaceous, reddish VRW samples (Figs 5a and 6g) were not produced using the above clay paste recipe, due to their different clay matrix and the finer, unimodal nature of their inclusions (Fig 7c). It is likely that these ceramics were manufactured from a more iron-rich, silty clay source and without the addition of sand temper. A possible third recipe used for the manufacture of VRW at Brockley Hill is the mixture of a light and a darker coloured clay source in varying proportions with quartz-rich sand temper (Fig 5e). Such a scenario was proposed by Vince and Tomber (2005, 176) for the production of VRW at Northgate House and is suggested by the presence of distinctive streaks and swirls in the clay matrix of several samples (Fig 5e). Vince and Tomber (2005, 176) did not detect clay mixing in the five Brockley Hill VRW samples that they analysed, prompting them to infer that this red clay source could have had been collected locally to Northgate House.

In an attempt to interpret the possible sources of the three ingredients that appear to have been the main raw material ingredients used at Brockley Hill for the production of VRW, we have compared them petrographically and geochemically with the nine field samples collected in the general area of the site (Fig 4; Table 3). Exact compositional matches between archaeological ceramics and geological field samples are generally rare (Quinn 2013, 134–5) due to the intentional processing and mixing of clay and temper during pottery manufacture. However, we hoped to determine more generally whether sources of fine light-firing clay, red silty clay and quartz-rich sand were available near Brockley Hill.

Vince and Tomber (2005, 175) suggest that workshops in the Verulamium region pottery industry including Brockley Hill exploited light-firing clay of the Reading Beds (Fig 4). A source of light-coloured clay was sampled from a disused brickworks near Radlett, c 4km north of Brockley Hill (Fig 4; Table 3). This belongs to the Cenozoic Lambeth Group which includes the Woolwich and Reading Beds (Sumbler 1996, 99). In thin section fired briquettes of this clay source had a red-coloured clay matrix and contained abundant fine quartz and glauconite. This seems to rule it out as the source of the fine light-firing clay source used for the production of some of the VRW at Brockley Hill.

A possible source of sand temper exists at the site of Brockley Hill itself. The high ground in this area is occupied by superficial sand and gravel deposits of the Quaternary Stanmore Gravel Formation. However, these poorly-lithified fluvial or shallow marine sediments are known to have a high proportion of chert clasts, as confirmed by the petrographic analysis of a field sample collected at Brockley Hill (Fig 4; Table 3). With this in mind, it is not clear whether the Stanmore Gravel deposits

local to the kiln site were exploited for pottery production or whether another source of sandy material was used as temper. Suggett (1954) reported that a large quarry was found near the summit of Brockley Hill, which may have been located in the Stanmore Gravel Formation. Unfortunately, this could no longer be located.

The Stanmore Gravel lies on top of Cenozoic deposits of the Claygate Member of the London Clay Formation. This grey-coloured clay material was sampled in several locations near to the site (Fig 4; Table 3). In thin section it is characterised by red-firing clay with abundant sub-angular silt-sized quartz clasts and occasional white mica. These compositional characteristics might make it a candidate for the clay source used in the manufacture of the silty, reddish VRW ceramics from Brockley Hill (Figs 5a and 6g). Indeed, Tomber (2001, 1) puts forward this suggestion for the related VRW that she analysed from Brockley Hill. However, the field samples collected from the Claygate Member are considerably redder and more iron-rich than these sherds. They also contain rounded glauconite inclusions that are characteristic of the London Clay Formation, but do not appear to be present in the ceramics. London Clay, though widespread in southern Britain is not used at the present day for the mass production of ceramic products due to its high shrink-swell capacity (Sumbler 1996, 140). However, this could have been overcome by mixing it with another type of compositionally different clay.

Vince and Tomber (2005, 176) seem to suggest that the 'red firing micaceous clay' that they suspect was used in the production of some VRW at Northgate House could have been collected locally. However, their analysis of a highly heterogeneous sample of kiln lining from Brockley Hill reveals that one of its components is also a 'red-firing clay with abundant quartz and muscovite silt' (Vince and Tomber 2005, 175). This sample also contains sandy white material with rounded quartz sand of the type that may have been used for the manufacture of a significant number of other VRW sherds (eg Fig. 5b and c). Clay used for non-portable structures such as kilns or furnaces is often assumed to be locally derived. With this in mind it is possible that both a reddish silty clay source and light-firing clay were available at Brockley Hill, even though their exact locations could not be identified in this study.

Unfortunately, Vince and Tomber (2005) did not analyse any field samples of possible ceramic raw materials. Their interpretation of the transport of clay and/or pre-mixed paste from Brockley Hill to Northgate House appears to be based solely on the similarity between the VRW sherds excavated from the two sites. This and other alternative explanations for the close compositional relationship between the ceramic products of Brockley Hill and Northgate House are discussed below in the light of the new evidence provided by this study.

Our petrographic analysis of the 50 VRW sherds reveals that many of them contain elongate voids that are

aligned parallel to the margins of the parent vessel. These voids, which are likely to have formed during drying, follow the preferred alignment of the clay minerals in the samples, suggesting a strong vertical force during the pottery forming process. This is consistent with manufacture on a fast potter's wheel (Woods 1982; Whitbread 1996).

The optical activity of the clay matrix of the VRW sherds under crossed polars (XP) suggests that the ceramics were fired at a relatively low temperature, below *c* 850°C (Reedy 2008, 186; Quinn 2013, 191). The uniform colour within the thin sections indicates oxidising conditions and a sufficiently long firing duration allowing oxygen to fully penetrate the walls of the vessels.

8. Discussion and Conclusions

The detailed petrographic and geochemical analysis of well-dated VRW mortaria and flagon sherds from across the known operational period of the important Verulamium region pottery industry kiln site of Brockley Hill near Stanmore in Middlesex, has revealed that a high degree of compositional diversity exists within this common Romano-British ceramic ware. This echoes and amplifies the previous findings of Devereux *et al* (1982) and Vince and Tomber (2005) on selected samples from Brockley Hill and other Verulamium region pottery industry sites, as well Northgate House in the Upper Walbrook valley, London. The findings of the present study, which are based on the analysis of a large assemblage of 50 sherds clearly demonstrate the use of several different clay paste recipes and raw material sources at Brockley Hill. These include fine light-firing clay and quartz-rich sand temper, fine silty, micaceous more red-firing clay without added temper, and perhaps a mixture of the two. Comparisons with the local geology and selected field samples have provided clues as to the possible origins of some of these clay and temper sources, while the locations of others is unclear. The existence of gradational variation between the 50 samples that is difficult to subdivide visually and quantitatively seems to suggest the presence of natural geological variability that could be related to the use of these raw material sources over a long time, as well as the intentional or accidental mixing of the components in different amounts.

Notwithstanding some minor patterns such as the presence of less inclusion-rich flagons in Phase 2 (Flavian period) more inclusion-rich mortaria in Phase 5 (early Antonine period), very few clear correlations exist between either the shape of the pottery or the phase of the site from which the sherds originated. This appears to rule out the possibility that specific raw materials or recipes were used for the manufacture of VRW pottery with particular functions, or that there were distinct, conscious changes in raw materials and/or technology at the site over time. However, the existence of several

recipes that occur in contexts from several operational phases of the site is interesting and requires further explanation.

Given the discovery at Brockley Hill of VRW mortaria stamped with 32 different dies (Castle 1976, 211), it is perhaps tempting to interpret these paste recipes as the activities of several different potters working at the site. However, it has been proposed that the names depicted on Roman pottery stamps might in fact be those of potters acting as managerial persons or *officinatores* (Fülle 1997, 144) which could have been in control of different kilns. This could explain the presence at distant kiln sites of pottery stamped with the same die, without the need to invoke the itinerant movement of potters themselves (*cf* Hartley 2012, 113–14). It also offers an interesting perspective from which to understand the possible links between VRW production at Brockley Hill and Northgate House.

Our re-examination of the thin sections and geochemical data of Tomber (2001), Vince (2002a; 2002b), and Vince and Tomber (2005) indicate that their 16 samples have a very close petrographic and chemical composition to the 50 Brockley Hill sherds analysed in this study. Both datasets contain a similar range of petrographic and elemental variability and exhibit some very good petrographic and geochemical matches (Fig 6). The similarities between the Brockley Hill VRW samples analysed by Vince and Tomber (2005) and the material in this study is perhaps not surprising. However, the close compositional relationship between Brockley Hill and the Northgate House VRW ceramics of these authors is very interesting. Vince and Tomber (2005, 175) noted the similarity between the VRW of these two sites, but claimed that some of the Northgate House ceramics differed in that they were produced by the addition of 'local red-firing clay'. Our comparisons with their thin sections indicates that VRW pottery with this composition is in fact also present at Brockley Hill. Petrographic re-examination also revealed the presence of rare fired pottery inclusions within certain samples from both sites, which could represent the addition of grog temper.

Quantitative textural data has been used in some cases to define the products of different kiln sites and distinguish between them in exported material (Streeten 1982; Middleton *et al* 1985). The grain-size analysis of VRW ceramics from Northgate House might be a possible line of enquiry for future attempts to characterise its VRW and detect differences between this and Brockley Hill. However, the range of textural variation that has already been revealed by the study of Vince and Tomber (2005) suggests that this could prove difficult.

The striking compositional match between the range of VRW compositions within material excavated at Brockley Hill and Northgate House means that few clear criteria currently exist with which to characterise the macroscopically similar pottery of these two separate

kiln sites and it may therefore be difficult to distinguish between their products at other Roman sites in Britain. This unfortunate conclusion raises several important questions about VRW pottery and its production at Brockley Hill and Northgate House. Firstly, the data clearly indicate that pottery that is classified macroscopically as VRW contains a range of compositions, even at quite distant sites. That the supposed macroscopic similarity within VRW is not matched by compositional homogeneity perhaps suggests that this ware group should be re-assessed. Verulamium Region White Ware has long been known to exist in a range of colours (Tyers 1996, 199; Tomber and Dore 1998, 154). However, the existence of compositions that deviate from the general fabric description of VRW, such as the finer, redder, more silty and micaceous sherds detected at Brockley Hill and in the material of Vince and Tomber (2005) in this study, is not covered by the current definition of the ware.

The close petrographic and geochemical similarity between VRW from Brockley Hill and Northgate House might be interpreted in several ways. Since outcrops of light-firing clay do not occur in the area of Northgate House, that is characterized by the London Clay formation, Vince and Tomber (2005, 176) see it as evidence for the import of clay from Brockley Hill to Northgate House, perhaps with pre-mixed sand temper, where it was used to manufacture similar pottery. Whilst examples of the transport of ceramic raw materials in Roman times over distances of up to 10 km exist (eg Young 1977, 16), the kiln sites Brockley Hill and Northgate House are c 20 km apart. Transporting large quantities of clay and temper between these two locations would have been a significant undertaking in Roman times, despite the existence of Watling Street connecting the two (Fig 1).

If raw materials were indeed transported from Brockley Hill to Northgate House in order to produce VRW some 20 km closer to Roman London, then this perhaps implies that the local demand for this pottery must have been high. The possible movement of clay between the two sites also suggests that they were closely connected to one another. The presence of some VRW mortaria stamped with the same dies at Brockley Hill and Northgate House (Hartley 2005, 84) may indicate that certain *officinatores* were associated with the production of this class of pottery in both production centres. These workshop managers could have supplied raw materials to several different 'branches' and overseen the manufacture of VRW using specific preferred recipes.

The presence of multiple kiln structures at Brockley Hill might be in keeping with a model of multiple zoned workshop units (*officinae*) arranged in larger organisational units (*fliglinae*) (Seeley and Thorogood 1994). According to written sources from elsewhere in the Roman Empire (eg Fülle 1997, 121), lease contracts or a *locatio conductio* existed between *officinatores* and the owner the land or of a large pottery production centre,

who was usually a person of a higher social status. If the Verulamium region pottery industry was set up in order to meet the demands of the Roman garrisons flooding into Britain, then it is possible that Brockley Hill and other Verulamium region kiln sites could have followed such a model, with the landowner establishing the facility and offering contracts to suitable potters acting as workshop managers to produce a restricted repertoire of pottery vessels for a specific market.

The kiln site of Northgate House, which appears to have been in operation for a shorter period, during the second century AD, might represent a new production centre set up by the same or a different landowner in which *officinatores* from Brockley Hill and other sites also operated, bringing their raw materials and recipes with them. This tentative hypothesis might explain the close compositional similarity between VRW from Brockley Hill and Northgate House revealed by Vince and Tomber (2005) and this study. Its feasibility could be further tested through the detailed study of pottery stamps at the two sites as well as the compositional analysis of ceramics from other production centres in the Verulamium region pottery industry.

An alternative explanation to that above, and one which should certainly be considered, is that Northgate House contains VRW sherds that were produced in Brockley Hill and that could have been used as examples for copying. If the transport of raw materials over 20km is deemed to be unlikely, then the close compositional matches between the ceramics of the two sites could be explained in this way. This would imply either the consumption or discard of VRW produced at Brockley Hill by potters working at Northgate House. Such a possibility might be further explored by a re-examination of the available evidence for VRW production at both sites.

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Table 4. Normalised geochemical data for the 50 VRW ceramic sherds analysed from Brockley Hill in this study, as determined by ED-XRF. Major and minor elements expressed as weight percent (wt %), and trace elements expressed as parts per million (ppm). Elements below limits of detection and those potentially affected by alteration or contamination have been omitted. (F: flagon; M: mortarium)

Sample	Shape	Phase	Chemical Group	Major and minor elements - Weight percent (wt %)								Trace elements - Parts per million (ppm)															
				MgO	Al ₂ O ₃	SiO ₂	K ₂ O	CaO	TiO ₂	MnO	Fe ₂ O ₃	V	Cr	Ni	Cu	Zn	Ga	Rb	Sr	Y	Zr	Nb	Ba	La	Ce	Pb	
BH09	F	1	1	0.33	19.65	76.62	0.27	0.32	1.02	0.01	1.37	75	242	25	18	28	20	8	32	48	177	19	73	37	71	12	
BH11	M	3	1	0.43	19.01	76.13	0.54	0.37	0.76	0.01	2.17	61	239	24	41	35	19	21	44	33	167	13	141	32	28	21	
BH12	M	3	1	0.55	15.97	77.42	1.23	0.40	0.74	0.01	2.97	106	138	29	35	47	15	44	46	36	304	19	195	28	36	22	
BH13	M	3	1	0.54	20.68	74.72	0.70	0.30	0.61	0.01	2.10	70	301	46	53	38	15	30	39	27	146	15	114	30	27	17	
BH15	M	3	1	0.71	15.71	78.28	0.86	0.36	0.73	0.02	2.86	99	225	27	108	32	19	26	39	29	175	16	155	22	27	15	
BH21	M	2	1	0.57	19.45	75.53	0.28	0.32	0.92	0.01	1.44	74	263	28	19	22	17	9	34	45	248	57	66	34	88	15	
BH22	M	2	1	0.26	19.21	77.08	0.26	0.29	0.94	0.02	1.48	65	295	31	32	25	19	10	34	45	268	66	65	24	85	17	
BH23	M	2	1	0.39	19.36	76.05	0.47	0.28	0.77	0.01	2.11	56	239	23	22	49	18	15	39	30	153	15	134	36	44	18	
BH24	M	2	1	0.31	19.09	76.96	0.30	0.32	0.92	0.02	1.58	87	267	21	53	22	19	9	34	50	161	19	85	47	109	13	
BH26	M	4	1	0.47	15.78	80.25	0.54	0.36	0.71	0.01	1.53	78	263	18	32	21	17	20	41	25	161	12	124	22	24	16	
BH27	M	4	1	1.16	16.79	77.23	1.36	0.08	0.71	0.02	1.58	78	226	18	68	43	18	24	20	26	144	14	102	28	32	15	
BH28	M	4	1	0.55	16.57	79.24	0.87	0.17	0.72	0.01	1.53	117	242	18	27	58	20	23	29	25	151	14	113	24	31	15	
BH29	M	4	1	0.51	17.54	78.30	0.85	0.21	0.73	0.01	1.49	59	237	18	34	71	19	15	30	25	153	16	107	28	32	14	
BH30	M	4	1	0.48	17.41	78.36	0.62	0.32	0.72	0.01	1.70	82	211	18	44	62	18	18	37	25	153	13	120	29	27	16	
BH31	F	4	1	1.04	18.32	74.52	1.74	0.46	0.79	0.01	2.79	124	267	31	20	81	20	75	62	30	156	16	208	48	82	24	
BH38	F	3	1	0.66	19.36	75.42	0.76	0.26	0.76	0.01	2.36	109	261	32	32	53	20	38	42	40	202	18	158	36	58	23	
BH39	F	3	1	0.46	18.20	76.01	0.45	0.33	0.83	0.01	3.09	96	238	27	45	27	22	19	37	33	179	20	211	23	35	18	
BH40	F	3	1	0.60	20.68	73.35	0.63	0.41	0.96	0.01	2.99	122	256	25	33	49	19	31	48	48	212	21	164	71	186	27	
BH43	M	5	1	0.91	19.79	73.35	1.70	0.33	0.84	0.01	2.53	146	270	35	32	54	18	72	60	48	259	17	254	71	150	28	
BH44	M	5	1	0.94	17.52	76.04	0.96	0.27	0.60	0.01	2.07	54	249	23	30	37	13	37	50	29	249	16	203	30	34	22	
BH45	M	5	1	0.63	18.11	72.82	0.73	0.58	0.95	0.19	4.24	110	172	44	31	104	19	29	109	52	313	18	377	51	97	30	
BH46	M	5	1	0.88	18.14	73.89	1.93	0.28	0.93	0.02	3.32	139	227	32	20	48	18	68	56	47	425	22	265	57	80	20	
BH47	M	5	1	1.18	17.35	75.09	1.55	0.24	0.85	0.01	2.26	133	271	25	25	35	19	65	61	42	354	22	243	51	108	24	
BH48	F	5	1	0.61	19.36	74.83	0.96	0.36	0.86	0.02	2.32	89	268	24	22	42	20	43	56	37	255	18	234	29	52	46	
BH50	F	5	1	1.01	16.13	76.48	1.98	0.33	0.80	0.01	2.76	97	292	39	20	82	15	77	56	51	329	16	268	52	100	35	
BH52	F	5	1	0.84	18.30	75.05	1.30	0.24	0.96	0.01	2.80	80	220	27	29	45	21	53	66	45	292	22	230	55	96	45	
Mean Standard Deviation				0.65	18.21	76.12	0.92	0.32	0.81	0.02	2.29	93	245	27	35	47	18	34	46	37	222	21	170	38	67	22	
BH01	M	1	2	0.26	1.46	1.86	0.53	0.09	0.11	0.04	0.72	27	36	8	19	21	2	22	17	10	77	13	77	15	42	9	
BH02	M	1	2	0.54	23.88	71.15	0.72	0.30	1.04	0.01	1.71	90	270	28	35	29	25	28	48	50	155	23	116	41	82	18	
BH03	M	1	2	0.69	24.21	69.65	1.32	0.27	1.07	0.01	2.44	128	261	30	16	28	26	59	62	43	167	21	163	34	79	21	
BH04	M	1	2	0.41	19.74	74.86	0.45	0.30	1.05	0.01	2.74	111	260	27	34	32	22	17	38	43	196	22	100	30	77	75	
BH05	M	1	2	0.66	28.22	65.96	1.14	0.36	1.15	0.01	2.10	102	264	32	14	39	30	50	68	54	191	27	174	47	98	27	
BH06	M	1	2	0.58	24.92	69.96	0.60	0.31	1.13	0.01	1.83	92	297	31	20	29	28	23	49	52	171	25	124	38	83	17	
BH06	F	1	2	0.69	25.19	68.42	1.19	0.28	1.09	0.01	2.70	88	267	33	14	41	26	55	62	46	187	24	190	48	89	24	

BH07	F	1	2	0.64	23.91	65.37	1.71	0.39	1.12	0.01	5.19	101	179	33	23	60	27	75	116	46	217	28	460	43	97	29	
BH08	F	1	2	0.58	20.65	74.35	0.76	0.29	1.03	0.01	1.97	129	254	27	29	33	23	32	44	45	189	23	117	43	85	18	
BH10	F	1	2	0.78	20.88	71.93	0.68	0.31	1.03	0.01	2.66	115	278	36	23	27	24	28	46	47	188	21	113	41	88	19	
BH14	M	3	2	0.59	21.36	72.96	1.23	0.36	1.00	0.01	2.01	104	303	26	15	35	21	52	61	39	201	21	202	43	57	31	
BH16	F	2	2	0.58	22.40	70.64	0.95	0.40	1.24	0.01	3.11	165	261	33	35	37	32	51	62	48	241	26	262	39	48	30	
BH18	F	2	2	0.86	22.44	69.59	1.00	0.40	1.21	0.02	3.24	131	229	32	29	33	27	54	55	45	245	31	197	26	41	28	
BH19	F	2	2	0.69	23.25	69.58	1.78	0.41	1.19	0.01	2.66	146	336	23	15	31	29	87	82	38	263	41	267	40	56	39	
BH20	F	2	2	0.41	22.67	69.33	1.11	0.50	1.32	0.01	3.01	173	214	34	35	43	32	56	99	48	320	52	396	27	46	36	
BH25	M	2	2	0.78	22.20	70.78	0.97	0.26	0.98	0.01	2.47	115	288	27	20	35	24	45	53	40	180	18	166	44	77	26	
BH36	F	3	2	0.77	22.38	71.01	1.19	0.34	1.00	0.01	2.86	115	283	35	48	54	24	55	54	47	269	20	186	46	96	28	
BH37	F	3	2	0.68	24.20	69.32	1.11	0.36	1.20	0.01	2.68	118	280	23	32	43	27	48	52	38	224	22	193	50	105	31	
BH49	F	5	2	0.55	23.03	68.76	0.51	0.71	1.01	0.02	3.35	175	208	28	30	70	25	16	108	41	245	23	206	26	48	29	
BH51	F	5	2	0.87	19.51	72.40	1.49	0.33	1.30	0.03	3.47	177	342	23	22	44	25	61	56	35	268	22	256	32	44	71	
				Mean Standard Deviation	0.65	22.90	70.32	1.05	0.36	1.11	0.01	2.75	125	267	29	26	39	26	47	64	44	217	26	205	39	74	32
BH32	F	4	3	0.93	25.59	65.81	1.37	0.41	1.03	0.02	4.35	106	281	35	16	43	25	65	78	68	221	22	214	161	389	54	
BH33	F	4	3	1.08	23.40	66.85	1.60	0.40	1.00	0.01	4.00	164	287	35	23	40	25	73	80	60	222	22	246	144	340	55	
BH34	F	4	3	0.82	23.87	68.39	1.37	0.37	0.98	0.01	3.71	184	282	33	15	39	22	64	74	60	210	18	221	132	336	48	
BH35	F	4	3	0.84	26.11	65.33	1.37	0.39	1.07	0.01	4.34	198	237	37	18	42	25	64	75	68	219	23	212	151	383	53	
				Mean Standard Deviation	0.92	24.74	66.59	1.43	0.39	1.02	0.01	4.10	163	272	35	18	41	24	67	77	64	218	21	223	147	362	52
BH17	F	2	Outlier	0.12	1.31	1.35	0.12	0.02	0.04	0.00	0.31	40	23	2	4	2	1	5	2	5	6	2	16	12	28	3	
				Outlier	0.50	25.63	65.62	1.43	0.77	1.34	0.01	3.47	154	230	34	26	53	34	72	104	45	269	30	461	29	40	36

Table 5. Comparison between the geochemical compositions of VRW ceramics analysed in this study with data on 16 VRW sherds analysed by Vince (2002a; 2002b) and Vince and Tomber (2005) from Brockley Hill and Northgate House. The upper part of the table compares the mean and standard deviation of selected elements. The lower part of the table compares the geochemistry of specific samples from the two datasets that have a related petrographic composition in thin section (Fig 4). Certain elements have been left out due to their absence in one of the datasets. Data normalised to 100%.

		MgO	Al ₂ O ₃	SiO ₂	K ₂ O	CaO	TiO ₂	Fe ₂ O ₃	V	Cr	Ni	Cu	Zn	Sr	Y	Zr	La	Ce	Pb
Brockley Hill This study n = 50	Mean	1	21	73	1	0	1	3	112	255	29	30	43	57	42	221	47	92	28
	Standard Deviation	0	3	4	0	0	0	1	36	38	6	16	17	22	11	62	32	87	14
	Mean	0.72	18	76	1	0.29	0.70	2.8	94	100	29	16	59	62	24	70	68	132	44
	Standard Deviation	0.23	2.9	4.2	0.42	0.072	0.11	0.76	27	16	7.0	6.6	29	17	12	13	43	102	15
	Mean	1	19	76	0.85	0	0.65	3.1	87	86	28	15	34	66	27	73	62	120	31
Northgate House Vince and Tomber 2005 n = 5	Standard Deviation	0.23	2	3.5	0.55	0.38	0.23	0.81	28	15	13	5.7	12	24	8.8	12	17	35	13
	Sample	MgO	Al ₂ O ₃	SiO ₂	K ₂ O	CaO	TiO ₂	Fe ₂ O ₃	V	Cr	Ni	Cu	Zn	Sr	Y	Zr	La	Ce	Pb
Brockley Hill This study	BHC029 Fig 6 A	0.51	17.54	78.3	0.85	0.21	0.73	1.49	59	237	18	34	71	30	25	153	28	32	14
	RTS562 Fig 6 B	0.35	13.54	83.2	0.72	0.1	0.56	1.47	51	82	17	9	31	27	9	57	26	34	31
	RTS609 Fig 6 C	0.32	16.72	79.9	0.27	0.16	0.45	2.16	55	67	17	10	21	44	18	57	42	82	19
	BHC017 Fig 5 D	0.50	25.63	65.6	1.43	0.77	1.34	3.47	154	230	34	26	53	104	45	269	29	40	36
Brockley Hill Vince and Tomber 2005	RTS566 Fig 6 E	0.73	21.26	72	1.31	0.33	0.81	3.44	108	114	29	12	40	80	42	95	141	320	60
	RTS610 Fig 6 F	0.87	21.73	70.8	1.54	0.56	1.02	3.25	116	86	32	24	42	72	23	86	52	101	17
Brockley Hill This study	BHC046 Fig 6 G	0.88	18.14	73.9	1.93	0.28	0.93	3.32	139	227	32	20	48	56	47	425	57	80	20
	RTS533 Fig 6 H	0.79	13.11	79.6	1.36	0.4	0.66	3.89	104	84	28	20	48	56	16	68	31	48	33

‘Hoo ware’ – an investigation and comparative analysis of evidence recovered from a first century AD Romano-British site in North Kent

David Applegate

1. Introduction

The discovery in the mid 1950s of an assemblage of Romano-British pottery flagons of mid-first century AD date amidst the saltmarshes at Hoo (Fig 1) resulted in a published typology of the pottery (Blumstein 1956). Whilst no evidence of a pottery kiln was discovered the assemblage was tentatively interpreted as the working debris from a possible kiln due to a small number of wasters that were identified amongst the material (Blumstein 1956, 276). In 1996 members of the Upchurch Archaeological Research Group discovered another large assemblage of typologically identical pottery from the same location (Site 056) (UARG 1999, 12) which, significantly, included an amount of new evidence related to the potential production aspect of the site. With the question in mind as to whether site 056 was the location of a Romano-British flagon manufacturing enterprise the new evidence has been intensively studied. Utilizing Blumstein’s original typology and other regional studies the Upchurch Group’s Hoo ware assemblage has been quantified. A petrological analysis was initiated to determine if the flagons, the other pottery forms that were found and the kiln debris were all manufactured from the same clay source.

The study highlights new evidence from the site in the form of variants of collared flagons and the discovery of four ribbed handles, some of which may have come from two handled flagons previously unknown from this site, as well as, of course, the kiln bar fragments and debris. The substantial number of ring-neck flagons represented amongst the later assemblage may also be of significance for the chronological duration of the site. The analysis of this new ceramic assemblage and kiln material in tandem with the earlier evidence reported by Blumstein would appear to substantiate the theory that site

056 is indeed the location of a specialist Romano-British workshop. This paper presents details of the typology and characterization of the material, as is appropriate for an apparent production site. It places the finds in a wider perspective.

2. Background

2.1 The initial discovery and its significance

The chance discovery in August 1955 of a large unstratified assemblage of Romano-British pottery by local beachcomber Mrs B. De Seyssell in the intertidal zone off Hoo St Werburgh in North Kent, culminated in a form classification and typology by Miss M. Blumstein (Fig 2) which appeared in volume 70 of *Archaeologia Cantiana* (Blumstein 1956). Since the inaugural publication in 1956 this distinctive pottery has been increasingly identified in many archaeological contexts and it is now considered a classic indicator for first century AD Romano-British activity (Monaghan 1987, 173; Davies *et al* 1994, 38; Thorp 2010). Chiefly consisting of oxidized white-slipped flagons, the earliest of which are of the characteristic Continental collared *Hofheim* (Form 50) types, so named after the first century military site in Germany where the forms were initially identified and classified (Ritterling 1913, 1 and 278; Marsh and Tiers 1978, 547; Swan 1988, 14–5, De la Bédoyère 1989, 98), they are representative of an important local industry.

The early date of the initial production phase at Hoo of *c* AD 43–70 indicates that the ware was produced soon after the Roman conquest of Britain. Conventionally it is suspected that it represents the work of immigrant craftsmen who brought with them the skills to produce such Romanized exotica, perhaps, it has been postulated,

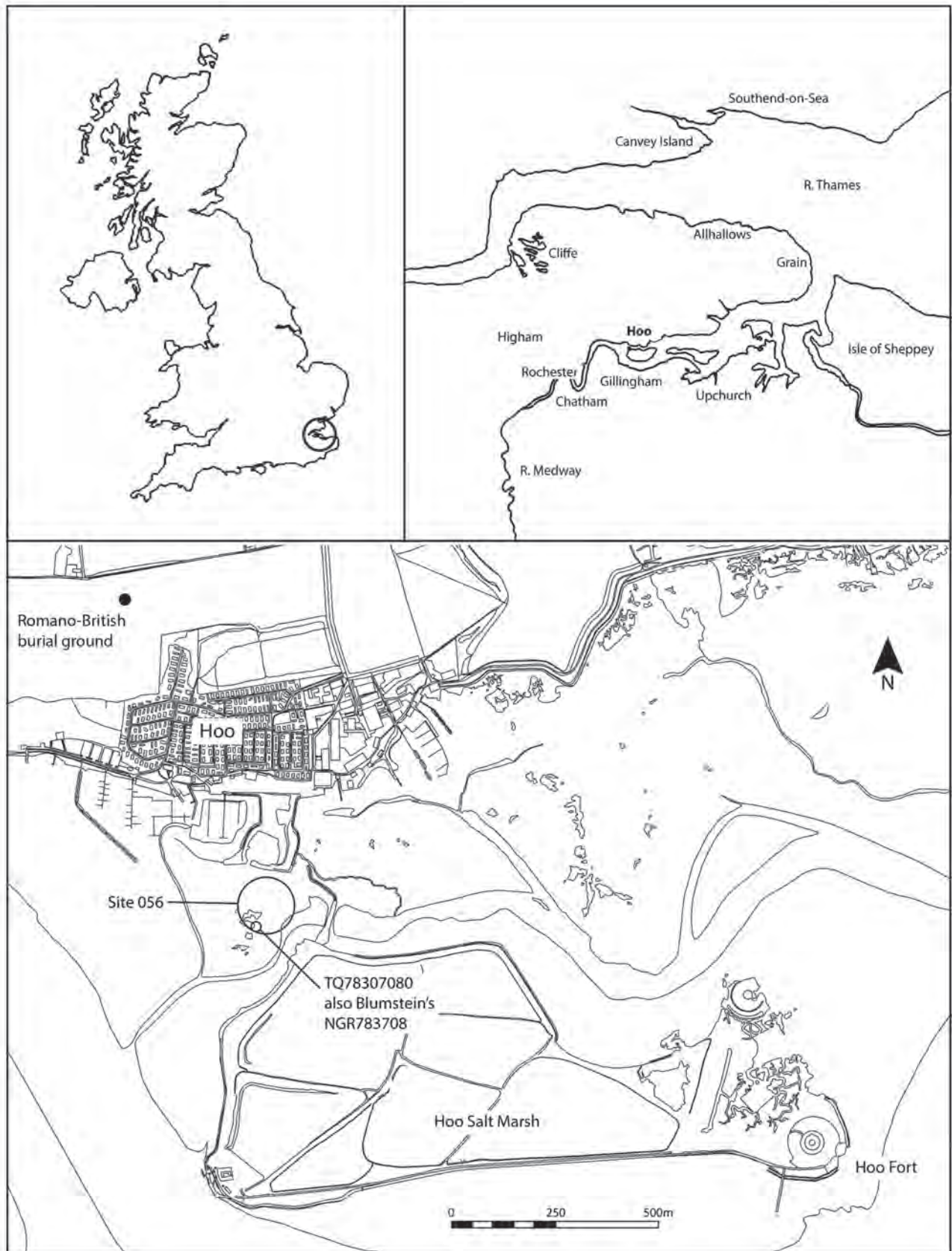


Fig 1. The location of the Hoo site (UARG site 056). (Top left: UK and Northern Ireland, © about.com geography 2012; Top right: the Thames and Medway estuaries showing the site of Hoo (prepared by David Applegate and Lloyd Bosworth); Bottom: © Ordnance Survey with annotations by Ian Jackson; prepared by Lloyd Bosworth)

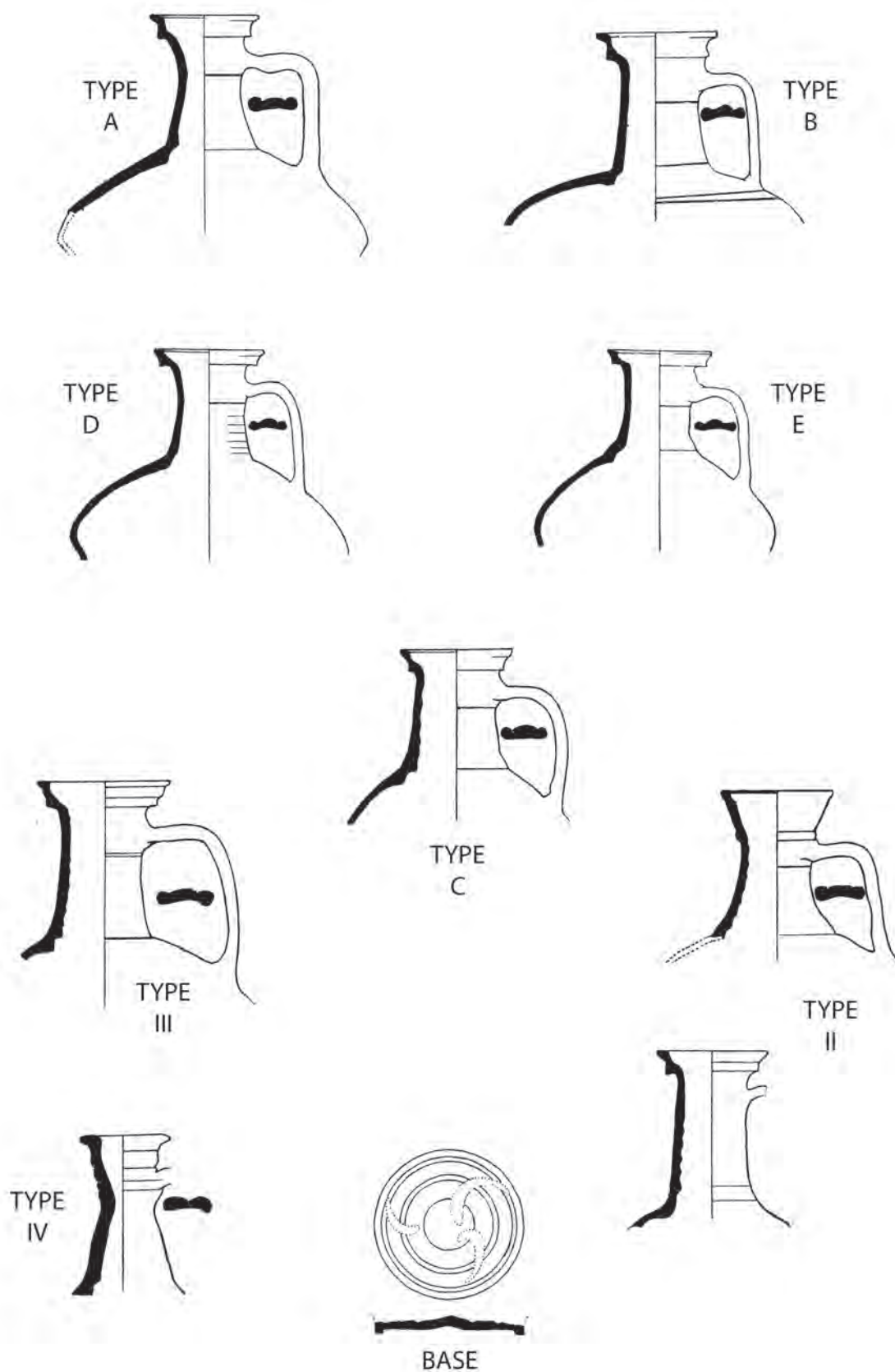


Fig 2. M. Blumstein's classification of Roman pottery from Hoo (after Blumstein 1956, 275). Figure © Kent Archaeological Society, used with permission. Scale 1:4

to exploit the growing military market in the province (Swan 1984, 85; Monaghan 1987, 217; Pollard 1988, 47 and 57). This hypothesis has been applied to other first century AD flagon producing centres in Kent such as Eccles (Detsicas 1977, 29) and the products from a kiln excavated in the late 1920s at Otford (Pearce 1930, 160; Monaghan 1987, 36) and one in 1952 (kiln II) at St. Stephen's Road, Canterbury (Jenkins 1956, 50–6). Similar products were also produced in Kiln 26 at Colchester (Hull 1963, 158–60) and are also known from phase one at the fort at Usk (Greene 1973, 31 and 34). The military association may indeed, have been the initial inspiration for production at Hoo, (Swan 1984, 85) but the discovery of the ware at many settlement sites in Kent and a very strong occurrence in London (Davies *et al* 1994, 38–40; Anna Doherty (Archaeology South-East) pers. comm.; Ed Biddulph (Oxford Archaeology) pers. comm.; Jason Monaghan (Guernsey Museums) pers. comm.; Mark Williams (Wessex Archaeology) pers. comm.) is demonstrable of a successful and distinctly civilian market for the products as well (Swan 1984, 83). The early introduction of the flagon and the use of white or cream-slip at Hoo (a post-conquest trait) are also a very strong indicator of some of the profound changes in the pottery being produced in Britain at this time (Monaghan 1987, 185; Greene 1992, 164–5; Seager Smith *et al* 2011, 50).

Since its discovery the Blumstein assemblage has tentatively been interpreted as material derived from a suspected nearby kiln(s) due to the small number of wasters (12 in number) that were present (Blumstein 1956, 276–7). However, the paucity of kiln debris coupled with a distinct lack of stratified deposits was problematic, leading to speculation rather than a firm conclusive deduction (Blumstein 1956, 277; Marsh and Tyers 1978, 545; Swan 1984, 85; Detsicas 1987, 161; Monaghan 1987, 27; Pollard 1988, 38; Seager Smith *et al* 2011, 50). The intervening years since 1955 witnessed no further significant discoveries from the location until 1996.

2.2 The 1996–2003 assemblage

In 1996 a new assemblage of Hoo ware, which also included a quantity of kiln debris, was discovered by members of the Upchurch Archaeological Research Group (hereafter abbreviated to UARG). In that year members of the Group were carrying out a walk-through survey of the north foreshore of the Medway estuary just to the south of Ford Marsh to determine if phragmites peat formations of known Late Bronze Age date found in the south of the estuary were also present at Hoo. The site is just one of the many intertidal sites under observation by the Group and has been designated the site code (056) in the UARG Site Location Summary; the latter provides further information related to location topography and feature context and date (UARG 1999). The UARG also knew that in 1955 a large assemblage of Romano-British

pottery had been found in the locality but this aspect of the site did not form part of the original survey criteria.

It is generally acknowledged that the 1955 Hoo ware assemblage was discovered due to the result of extensive tidal erosion, a common occurrence in the estuary (Evans 1953, 112; Monaghan 1987, 22; Jackson 2003, 38; Young 2004, 4). The erosion was expedited by the construction of a (then) relatively new embankment, which appears to have adversely deflected the tidal current to such an extent that it was deemed that nothing further remained of the site (Blumstein 1956, 273; Monaghan 1987, 27). The presence of marine barnacles (*Balanus balanoides* and *Elminius modestus*) which heavily covered the sherds (Blumstein 1956, 273; Major 1973, 82–4), is also highly suggestive that the assemblage was the result of erosion.

In the late 1990s further development at Hoo Marina appears, again, to have affected the equilibrium of the tidal currents in the area and the UARG's well-timed visit coincided with another large-scale erosive episode. While conducting their survey the UARG discovered in the bottom of a deep tidal channel a considerable quantity of stray, barnacle covered fragments of white-slipped oxidized Romano-British pottery consistent in date and character with the discoveries reported on by Blumstein in *Archaeologia Cantiana* in 1956.

These discoveries were extensively photographed and careful notes and grid references taken. Recognizing the significant link with the earlier finds an important decision was made to retrieve selective and diagnostic material. This included all flagon bases, tops, handles, rim sherds and identifiable wasters that were encountered, along with a representative quantity (160 fragments) of flagon neck sherds lacking the rim, and 205 fragments of body sherds from the thousands of sherds that were exposed. Amongst the many flagon remains was a quantity of sherds from other Romano-British form types that had likewise been eroded out, and just as with the earlier assemblage many of these were in the same fabric as the flagons and some displayed the same white or cream slip; these too were collected (Blumstein 1956, 276; Monaghan 1987, 27, 217). Although the quantity of these other forms is small, they are significant for what they reveal about site 056.

In addition to all of this pottery evidence, the discovery of a quantity of kiln bar and other kiln debris and two small yet highly significant lenses of *in situ* material added a new and important dimension to the recording and collection stratagem. Subsequently, between 1996 and 2003 further visits by the UARG produced an assemblage totaling just over several thousand assorted fragments.

In essence the present study has been a two-fold exercise, the aim being to produce a full archive to be submitted to the UARG, whilst at the same time addressing the question as to whether manufacturing occurred at the site. The chance to access and study such a large amount of early Romano-British ceramic

evidence and to submit the findings as part of an undergraduate degree project also seemed a fortuitous opportunity not to be missed. Pursuing this task, I was able to submit the study in 2012 as my Archaeological Project, towards my degree in Archaeological Studies at the University of Kent. It is the intention of the Group to find a local museum that will take on the curatorship of the assemblage and the archive.

In order to examine whether pottery manufacture took place at the site a detailed study and analysis of the Upchurch Group's Hoo ware assemblage was undertaken. Establishing the probability that this was a production site was recognized as likely to be a significant finding. The typology formulated by Blumstein from the earlier assemblage has been utilized to aid this process and that discovery and material provides a useful comparative dimension to assist the present study. In sum the 1996–2003 assemblage indicates much more certainly that the islets on Ford Marsh, which in Roman times almost certainly formed part of the mainland (Blumstein 1956, 273), were indeed the location of a specialist Romano-British flagon manufacturing site.

2.3. Roman evidence from the wider area

Since the initial discovery of Hoo ware in 1955 occasional references have been made to Romano-British evidence being found on the saltings at Hoo (LMARG 1965, 273; Wessex Archaeology 2005, 12) and Romano-British occupation and cemetery evidence is well-documented for Hoo St Werburgh and the surrounding environs. Early accounts testify to the discovery of burials with grave goods on, or close to, the marshes and the discovery of Roman building foundations close to the river (Wickham 1876, 75–6; Page 1932, 157). The find-site marked on Fig 1 as 'Romano-British burial ground' corresponds to the Kent HER No. TQ77 SE10. In 1990, three Roman enclosure ditches and some building debris discovered close to the parish church were dated by pottery to AD 50–120 (Martin 1991, 53–60). Further evidence of Romano-British occupation was found on a pipeline excavation by Wessex Archaeology (Moore 2002, 261, 266 and 269) and important excavations at Damhead Creek uncovered extensive evidence of Romano-British pottery manufacture (Griffin *et al* 2004, 8). One of the excavated areas has produced a large assemblage of sherds and wasters (including flagons) some in Hoo ware (coded R6D in the report) but most were in a virtually identical fabric (R6C) (Griffin *et al* 2004, 38 and 40–4; Malcolm Lyne (Independent Roman Pottery Specialist pers. comm.) equivalent to the later North Kent white-slipped ware (NKWS) (Davies *et al* 1994, 40).

Recent excavations by MOLA close to Hoo St Werburgh have revealed extensive evidence including a rectangular building associated with a kiln. A small enclosed cemetery was also discovered (MOLA 2011). The overall impression implied by all this archaeological

evidence is one of an intensively occupied landscape during the Roman period.

3. The Upchurch Archaeological Research Group

The UARG is headed by Ian Jackson, an amateur archaeologist whose lifetime study (together with Gerald Clarke) of the Upchurch Marshes has been instrumental to furthering our knowledge of the archaeology of the intertidal zone. Through diligent surface surveys of a wholly non-invasive nature a wealth of information has been recorded (Jackson 2003). The erosion and re-deposition processes that continually change the nature of intertidal environments (Evans 1953, 109–12; Allen and Gardiner 2000, 186–98; Buckley 2000, 8–9) mean that the non-invasive surface approach is the most effective means of recovering and understanding the emerging picture (Jackson 1962, 190–5; Jackson 1972, 288–90; Jackson 1975, 295–8; Jackson 2003, 20). The UARG have a large number of sites under continual investigation and site 056 is just one these (UARG 1999). The site itself has invariably been difficult to access and requires landowner permission; the negotiation of mudflats and the crossing of a tidal creek was only possible on the lowest tides and now is extremely dangerous as there has been an accumulation of alluvial silt in the channel which has covered the 1996–2003 find location. Safety is of paramount importance to the UARG (Jackson 2003, 21) as mudflats of the intertidal zone are potentially very hazardous environments to the uninitiated (Murphy and Wilkinson 1991, 10; Allen and Gardiner 2000, 19–20; Wessex Archaeology 2005, 12 and 16–7).

4. Site Location

The site is situated on the tidal saltmarshes and mudflats on the northern bank of the Medway estuary in the parish of Hoo St Werburgh in North Kent (Figs 1 and 8). The tract of marsh and small group of islets between Hoo Marina and Hoo Island just south of Ford Marsh (Figs 3–5) is where the original 1955 scattered assemblage was collected from. Blumstein recorded the location as (NGR TQ 783 708) (Blumstein 1956, 273). The Historic Environment Record (HER) provides two grid references (TQ 7828 7109) and (TQ 783 708) along with other details (HER 2009, website). The site location is also mentioned in the 1978 Southwark Excavations publication (Marsh and Tyers 1978, 545) and Vivien Swan's kiln gazetteer (TQ 7828 7094) (Swan 1984, 140; SGRP 2010, OA Digital website) and in both Monaghan (1987, 27) and Pollard's (1988, 204) regional studies. The UARG grid references are given as (TQ 7834 7090) for the main concentration of stray material (Figs 8 and 10) and (TQ 7830 7082) for the small amount of *in situ* material recovered. The grid references along with the



Fig 3. The islets on Ford Marsh on a receding tide, August 1996 (© Ian Jackson)



Fig 4. The islets on Ford Marsh at low tide, August 1996 (© Ian Jackson)



Fig 5. The islets on Ford Marsh in relation to Hoo Island, which appears in the mid distance, to the left, August 1996 (© Ian Jackson)

homogeneity of the ceramic evidence demonstrate that the two assemblages are from the same deposit.

5. Geology

Consultation of geological maps of the area shows that the geology of site 056 is Holocene alluvium. The underlying bedrock of Ford Island is composed of the Thanet Sand Formation (Evans 1953, 106; Gallois 1965, 47; British Geological Survey Map 1977; British Geological Survey Map 1997). The islets on Ford Marsh also have a peat formation (Fig 4) at approximately O.D Mean Sea Level, with a peaty silt horizon one metre above (Evans 1953, 114–5; UARG 1999, 12; Jackson 2003, 5, 33).

6. The Archaeological Contexts

The archaeological contexts of site 056 include phragmites peat formations, a deep tidal channel where the bulk of the stray pottery was found between Ford Island and the site, with a heavy concentration towards the east where the channel joins Middle Creek. Some round wood formations of unknown age also follow the line of part of the channel; these may be part of a kiddle or fish-trap structure (Jackson 2003, 10; 2012, 2–5).

In January 2003 two lenses of *in situ* material (Fig 7; Applegate 2012, fig 11) were recorded in the alluvium of two of the small islets just south of Ford Marsh at a higher level on the eastern side that equate with similar horizons found elsewhere in the estuary of approximately 1.500M Ordnance Datum Newlyn. A channel feature on a north–south alignment was recorded in the exposed bank to the north of the site. The channel could be associated with the *in situ* material. Finds associated with these features included a quantity of pottery, some small kiln debris fragments and burnt soil which appeared to be spreading towards the channel feature (Jackson 2012, 4–5). These pottery sherds were not covered in barnacles which is indicative that they were from a context that had not previously been exposed. The accompanying illustrations (Figs 8 and 9) were very kindly provided by Ian Jackson of the UARG and give details of the archaeological features observed and recorded (Jackson 2012, 7–9).

7. Methodology

The methodology used for recording this ceramic assemblage was as follows. Upon collection from UARG the pottery was contained in eight storage boxes. The pottery had been cleaned and packed soon after discovery. Individual bags with assorted sherds and a UARG label giving a find date and general location for stray finds and further information for the *in situ* material was located in each bag. Having previously discussed the recording strategy with Ian Jackson it was agreed that I would record

the boxes and associated bags as they were supplied and not separate the pottery into types as per normal practice (Orton *et al* 2004, 52). Recording each bag, I wrote a previously agreed coded number on the outside and put an additional label inside with the same code and the date I looked at it, for example 'DA1 – 30/7/11'. I also decided to photograph each bag of pottery (129 bags) with a scale which I subsequently printed out (349 A4 colour prints) and which incorporated the same code and date, primarily as a quick and easy visual reference.

The pottery has been quantified using the standard measures of sherd count, weight and EVE (Orton *et al* 2004). Using Microsoft Excel, detailed information was input directly into a database. Rim diameters were measured using a rim chart supplied by the UARG (UARG 1992, 25). Other measuring devices included a digital calliper and conventional internal and external callipers. Fabrics were looked at using a x20 hand lens and occasional use was made of a x30 lumagny device with an integrated light source. Once completed simple word files were created to list the results and subsequently detailed pie and bar charts were created in Adobe Illustrator and all of these were included in my Dissertation. The principal data are included in the Appendix to this article.

The Blumstein assemblage has not been quantified by me, rather I have used the data derived from Blumstein's 1956 report (Blumstein 1956). I viewed the assemblage at the Maidstone Museum storage facility on several occasions (RB boxes 144/1–27. 1990–41). This in itself was an interesting exercise and demonstrated that the UARG had discovered far more examples of ring-neck type flagons, and of course the kiln bar along with several other significant findings discussed further below. Whilst at the Museum I took the opportunity to photograph some of the assemblage and in turn I printed out these to A4 format. Along with Blumstein's seminal report I have made extensive use of regional studies particularly Monaghan's typology (Monaghan 1987) to aid identification of the UARG assemblage.

8. Petrographic Analysis of Hoo Ware Samples

An important aspect of this study is the petrographic analysis of the different types of flagon, kiln debris and other pottery found by UARG. Petrographic analysis in this case involved the thin sectioning of samples which were then viewed using a polarizing light microscope to identify mineralogical composition, but also help elucidate questions related to the type and geological location of the raw materials that were used. Such an approach can reveal aspects of the manufacturing technology (e.g. Williams 1979, 73–6; Peacock 1982, 3; Orton *et al* 2004, 140–1; Quinn 2009, vi; 2013, 151–212). Blumstein's original report mentions that some of the flagons and other forms were manufactured in a similar



Fig 6. Pool on Ford Marsh full of stray Hoo ware sherds, August 1996 (© Ian Jackson)



Fig 7. One of the in situ lenses on Ford Marsh islet, January 2003 (© Ian Jackson)

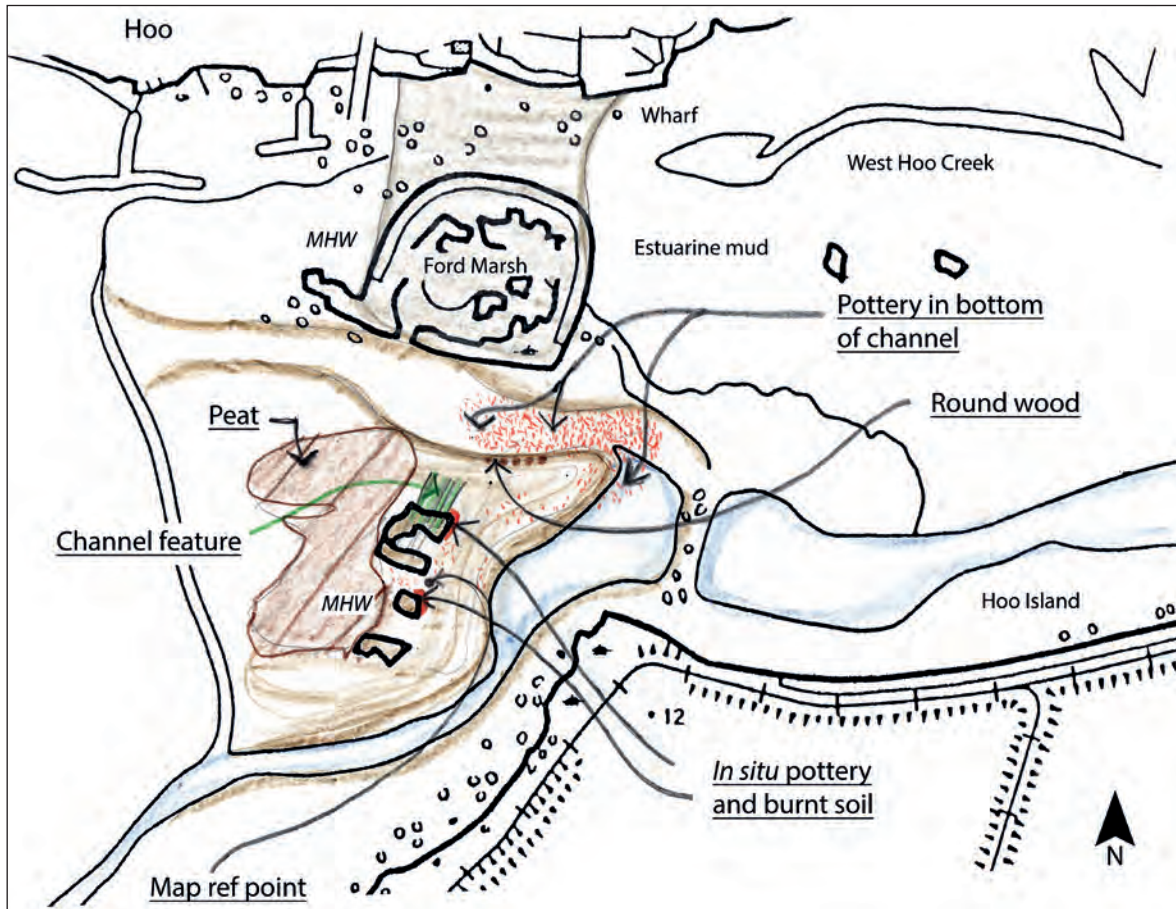


Fig 8. Site 056 showing location and archaeological contexts (© Ordnance Survey, with sketch and annotations © Ian Jackson; prepared by Lloyd Bosworth)

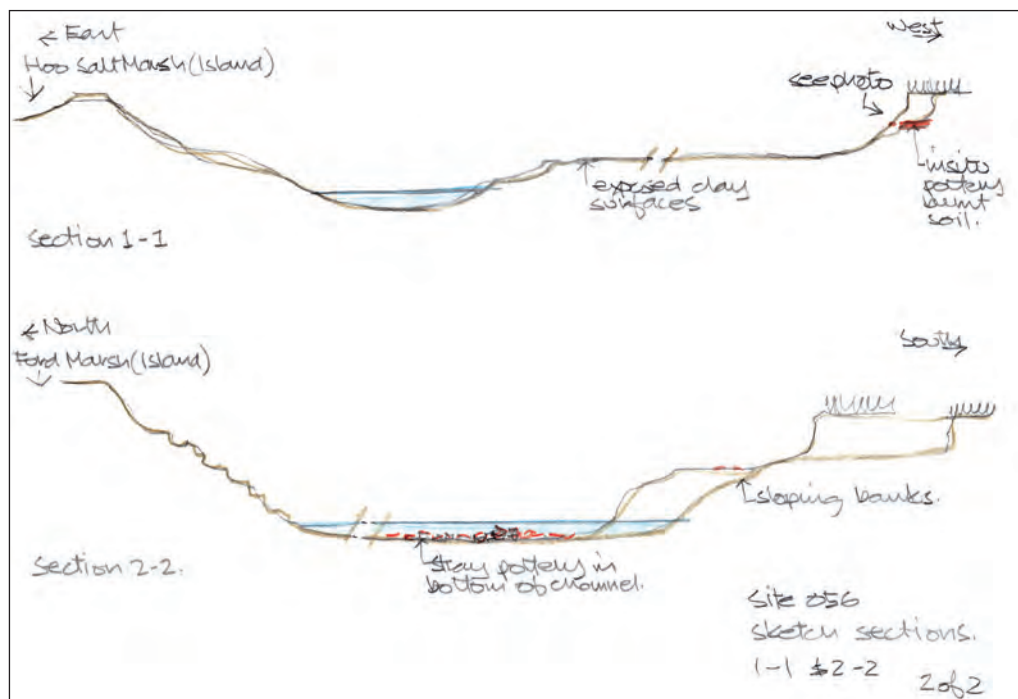


Fig 9. Sketch showing the archaeological contexts in section at Site 056 (© Ian Jackson)



Fig 10. Stray Hoo ware sherds lying in profusion within a tidal channel (© Ian Jackson)

fabric (Blumstein 1956, 274 and 276) and Monaghan also makes reference to this (Monaghan 1987, 27 and 217). This prompted further investigation and I decided that a petrographic analysis of key components of the UARG assemblage would be a worthwhile exercise with the prospect of informative results.

Detailed fabric descriptions of Hoo ware have of course been undertaken in the past, these include; Monaghan's N4/1s (Monaghan 1987, 253) and a section in the corpus volume of dated early Roman pottery from London which also describes a variant with calcareous particles and microfossils (Davies *et al* 1994, 38, 258). Some report based descriptions are also available such as Fabric 47 from Lullingstone Villa (Pollard 1987, 192) and one from a site in Dartford (Barber and Lyne 2004, 86). My study does not attempt to challenge any of these descriptions, merely to add something to the existing knowledge whilst answering specific questions related to the production aspect of site 056.

Having conducted a visual analysis of the kiln bar and pottery with a x20 hand lens the fabric colour and inclusions all appeared relatively consistent. However, I particularly wanted to ascertain if the kiln bars and other

Table 1. Details of the five samples examined by petrographic analysis.

Sample	Sample Type	Classification
Hoo 1	Kiln bar	
Hoo 2	Collared flagon	Monaghan 1E5
Hoo 3	Ring-necked flagon	Monaghan 1E2
Hoo 4	Oxidized body sherd	
Hoo 5	Rim sherd from a bowl	Monaghan 4F

pottery forms were manufactured from the same clay source as that used for the flagons because if they were, then the likelihood that Ford Marsh was the location of a specialist flagon manufacturing site could be further substantiated.

Dr Patrick Sean Quinn from the Institute of Archaeology, University College London, kindly agreed to undertake a full petrographic analysis of five samples that I had selected. In addition to this he also sampled some estuarine mud and produced a detailed report of all his findings which is held by the UARG with the archive. I summarize the findings of Dr Quinn's analysis here; I am grateful to him for conducting the study and for making available the photomicrographs of the samples for reproduction here (Figs 11–13).

The samples submitted for analysis (see Table 1) are representative of the predominant vessel forms to be found in the UARG assemblage along with a fragment of kiln bar. Dr Quinn compared the stylistically different samples to determine if similar raw materials and technology were used in their manufacture. Recourse and comparisons to earlier fabric descriptions already mentioned was also undertaken (Quinn 2011, 1). The use of geological maps and reports of the study area were also consulted to determine the likely source(s) of the raw materials used (Quinn 2011, 2).

8.1 Petrographic results and interpretation

The results of Dr Quinn's analysis proved highly instructive for this study. The fabric of the four submitted pottery samples was found to be petrographically similar. It is comprised of generally angular silt-sized quartz and mica inclusions, along with iron concentration features in a red-firing clay (Figs 11 and 12). The abundant silt and fine sand-sized inclusions are dominated by equant and elongate, sub-rounded to angular quartz, elongate biotite and occasional muscovite mica. Rarer plagioclase, flint and hornblende inclusions are sometimes present (Quinn 2011, 2). These inclusions are consistent with both Monaghan (Monaghan 1987, 253) and the London corpus (Davies *et al* 1994, 38) fabric descriptions already mentioned, although in the latter the description does not refer to biotite mica which is relatively abundant in the submitted Hoo samples. The inclusions appear to be naturally present in the selected clay used for the four Hoo samples. The uniformity of the inclusions and the

virtual absence of large particles beyond fine sand grade are perhaps indicative of intentional levigation however, an inexhaustible supply of natural alluvial clay with abundant fine inclusions was readily available from the nearby saltmarshes (Monaghan 1987, 178; Quinn 2011, 2).

All of the sampled sherds contain dark red or black coloured ferruginous inclusions (Fig 12, C1 and D1) of various sizes and some contain voids which occurred during firing. The features are a distinctive characteristic of Hoo ware being comprised of iron concretions formed in the clay during, or after its accumulation (Quinn 2011, 2).

One of the analysed samples Hoo 2 contains small, rare, inclusions of possible grog and radiolaria derived from flint (Fig 11, D). Sample Hoo 2 also contained rare plant matter that had carbonized during firing. This may not have been an intentional addition (Quinn 2011, 2–3).

Meso and macro-vughs occur in all the analysed pottery samples. They are probably attributable to the forming processes used. In one sample Hoo 4 the elongate voids parallel to the vessel margins indicate that this thin-walled vessel was wheel-thrown. Two of the samples Hoo 2 and Hoo 5 have large vughs which may be demonstrable of coil joins. The white-slip employed on the flagons is also visible on the petrographic samples Hoo 2 (Fig 12, F1) and Hoo 3 (Quinn 2011, 3). The source of the iron-free clay necessary to produce this slip is uncertain, but one possibility is located in the region of Cliffe Woods (Monaghan 1987, 178; Seager Smith *et al* 2011, 50).

Analysis of the samples is suggestive that the vessels were fired at or above 850°C. Hoo 4 was well-oxidized but Hoo 2 and Hoo 5 were not fully oxidized and have a reduced core with oxidized fringes (Fig 11, D), perhaps indicative of a shorter firing (Quinn 2011, 3).

The fabric of the kiln bar sample Hoo 1 was very similar to the pottery samples (Fig 11, A and B) but other inclusions demonstrate that the clay was used in its natural unprocessed state. Distinctive elongate voids which probably contained some kind of plant matter (Fig 12, E1) are also a distinguishable feature and may be representative of an additional temper (Quinn 2011, 3).

The clay source used for the Hoo ware samples analysed may have been fine estuarine alluvium. The bedrock of Ford Island is composed of Thanet Sand Formation (Gallois 1965, 47) and was not suitable for pottery making activity. The iron-rich and other inclusions found in the samples may have originated from the tidal landscape (Monaghan 1987, 179; Jackson 2003, 35; Quinn 2011, 4). Monaghan had previously explored this possibility and tested clay samples associated with a kiln on the Upchurch Marshes; the results indicated that the potters appear to have used the clays from the immediate vicinity (Monaghan 1982, 40–1; 1987, 178).

To further test the theory that estuarine alluvium was used as a source of clay Dr Quinn collected a sample of estuarine mud from Lower Upnor. This was shaped into a briquette without any processing, dried in an oven

at 110°C and then fired for one hour at 800°C under oxidizing conditions. The sample was then subjected to petrographic analysis (Fig 13, E2 and F2). The results were surprisingly similar to the Hoo ware samples that were analysed and is strongly suggestive that estuarine alluvium may well have been utilized. The carbonized plant remains from the kiln bar sample Hoo 1 may be representative of saltmarsh derived plant species (Quinn 2011, 4).

In sum, the petrographic analysis has demonstrated that the pottery and related kiln debris was manufactured from essentially the same material. This is significant as it supports the theory that site 056 relates to pottery production.

9. The Kiln Debris

The discovery of a quantity of kiln debris by the UARG was extremely significant and included fourteen kiln bar fragments (Fig 14), nine identifiable kiln lining fragments (Applegate 2012, fig 17) and seven other smaller fragments, probably kiln lining or derived from clay used to seal the kiln(s) (see quantified details in the Appendix). This latter material is similar to pads of clay and probable lining identified at other kiln sites (Noël Hume 1954, 81; Swan 1988, 59; Seeley and Drummond-Murray 2005, 140).

Whilst most of this kiln debris was found in a stray context in a deep tidal channel with the majority of flagon sherds, ten small fragments (two of which were heavily vitrified) were associated with the two small lenses of *in situ* material, but it must be stressed, that no remains of a kiln structure were present. The petrological analysis has established that the kiln bar material is manufactured from the same clay source used for the pottery. The discovery of some of this kiln debris in an *in situ* context further strengthens the link that the two are associated.

Previous finds reported by Blumstein refer to the discovery of twelve wasters and two fragments of briquetage (1956, 276). When I viewed the Blumstein assemblage at Maidstone Museum I actively sought this material out. There were actually three (small) pieces represented but they are not, in my opinion, briquetage associated with salt-making activity but are almost certainly kiln debris fragments derived from a pottery kiln, as the fabric is consistent with the UARG kiln bar finds.

The discovery of the diagnostic kiln material gives some indication of the type of kiln structure that was probably employed. We can only speculate on this of course because no structural remains of a kiln have survived or been exposed to date, but the presence of a quantity of kiln bar, together with the fragments of kiln lining, some with a slightly curved profile (Applegate 2012, fig 17) and displaying signs of repeated subjection to intense heat, is highly suggestive that a circular up-draught kiln, or series of kilns, that utilized kiln bar oven

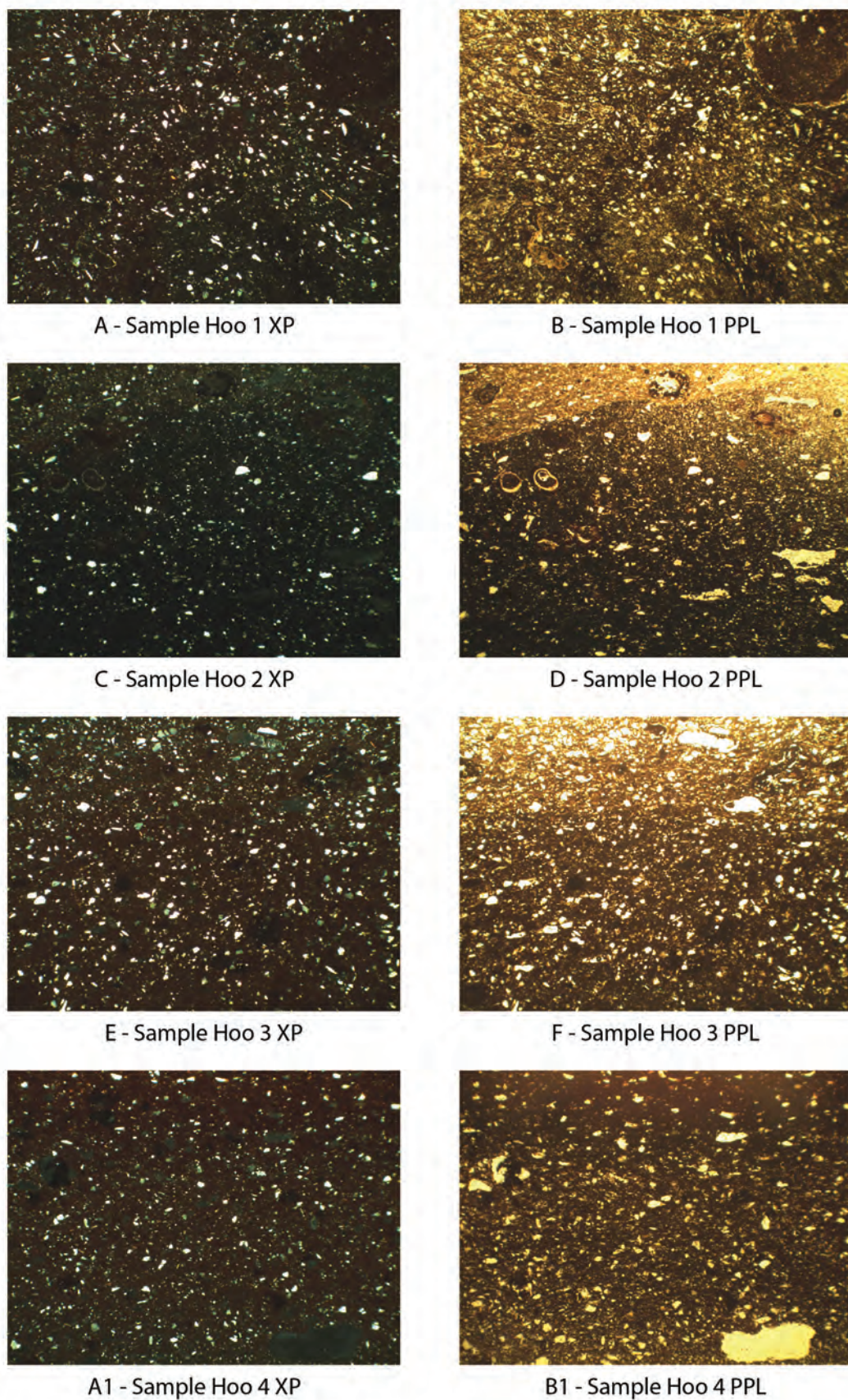
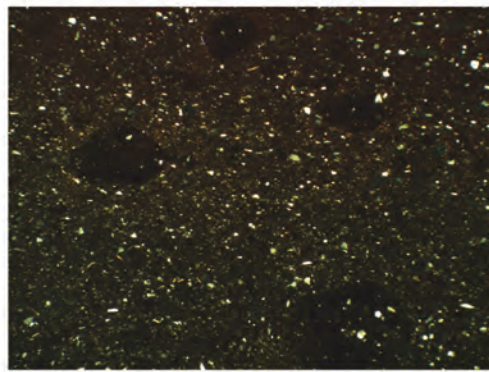
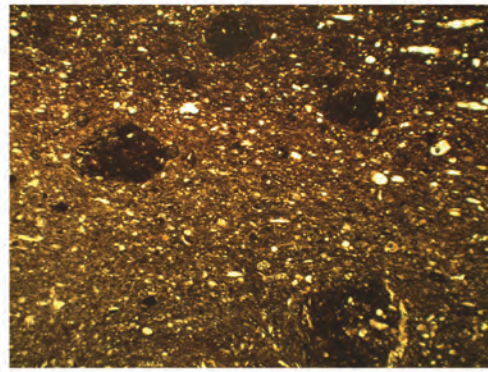


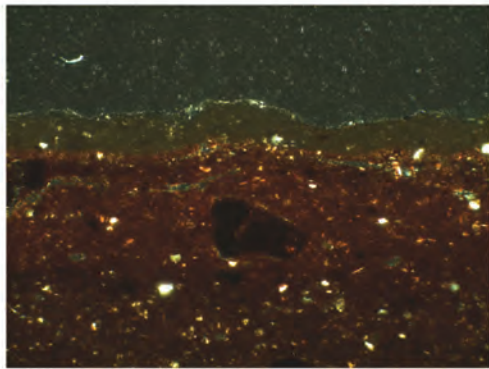
Fig 11. Thin section photomicrographs of analyzed Hoo ware ceramic samples. Plane polarized light (PPL); crossed polars (XP). Image width = 2.9mm (© Patrick Quinn)



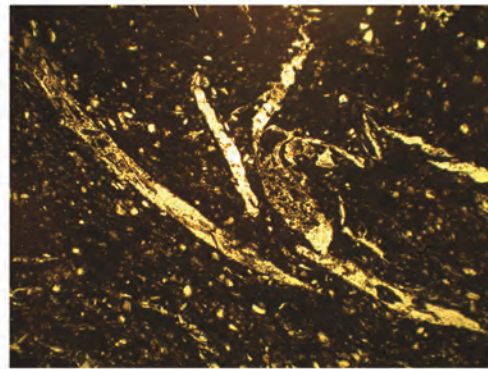
C1 - Sample Hoo 5 XP



D1 - Sample Hoo 5 PPL

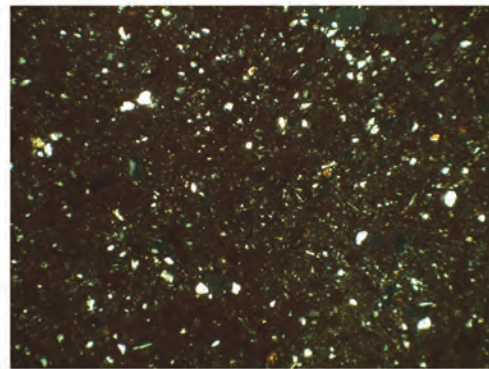


F1 - Sample Hoo 2 XP

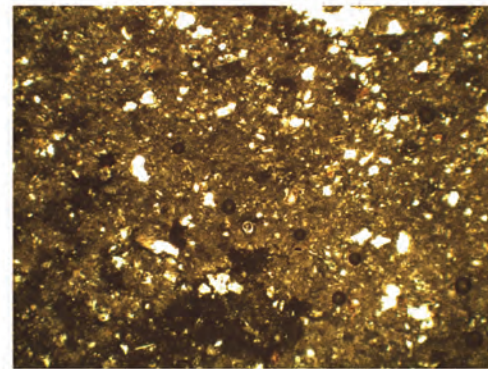


E1 - Sample Hoo 1 PPL

Fig 12. Thin section photomicrographs of analyzed Hoo ware ceramic samples. Plane polarized light (PPL); crossed polars (XP). Image width = 2.9mm, except samples Hoo 1 and Hoo 2 = 1.45mm (© Patrick Quinn)



E2 - Upnor clay XP



F2 - Upnor clay PPL

Fig 13. Thin section photomicrographs of fired samples of estuarine mud from Lower Upnor. Plane polarized light (PPL); crossed polars (XP). Image width = 2.9mm (© Patrick Quinn)

floors had once been fired in the vicinity (Corder 1957, 13; Jackson 2012). Ian Jackson has recorded a number of kilns on the Upchurch Marshes which used similar technology with pre-fabricated portable kiln bars which were supported by a ledge and a central pedestal (Jackson 1962; 1972; Swan 1984, 56).

The *in situ* features referred to and the small kiln debris fragments found within them are crucial discoveries for site 056, and may be the only evidence that is left to demonstrate that Ford Marsh was once the location of a prolific Romano-British pottery production enterprise.

10. Wasters

Blumstein recorded twelve wasters from the site and attributed this small number to the difficulties of identifying black wasters from the Medway mud (Blumstein 1956, 276). I believe what Blumstein was referring to were 'true wasters'. Whilst there are clearly a number of similar 'true wasters' amongst the UARG assemblage (Fig 15), I recorded every pottery sherd that exhibited any kind of flaw associated with failure during firing or preparation.

Monaghan has well-described the typical flaws found on pottery from the region (Monaghan 1987, 192) and sherds from the UARG assemblage show such characteristics. These features include over and under-firing, blistering, distortion, shrinkage, spalling, flaking, cracking and iron-spotting. In essence the majority of sherds from site 056 are probably wasters, and that should not be surprising if this was a production site.

11. Possible Burnishing Implements

Associated with one of the *in situ* contexts which contained fragments of pottery and kiln debris were a beach pebble and two flints. These were retrieved by the UARG. It is entirely plausible that these finds were associated with pottery manufacture at site 056 but it is open to question. Other sites have produced such finds (Young 1977, 19); a partially polished pebble probably used to burnish pottery was found at Oakleigh Farm, Higham, along with other items interpreted as being part of a potter's tool-kit (Catherall 1983, 119 and 139; Swan 1984, 50–2). The possibility remains that the items recovered from site 056 may have been similarly used in the production of Hoo ware.

12. The Pottery

The discussion below gives the number of examples of each flagon class present amongst the UARG assemblage. Comprehensive quantified data relating to all the individual categories of pottery are included in the Appendix.

12.1 Chronology

The assemblage from Hoo begins soon after the Roman invasion with the local production of collared *Hofheim* type flagons (a form that was extremely popular in the Rhineland) along with distinctive butt-beakers of Claudio-Neronian date (Blumstein 1956, 274–7; Monaghan 1987, 61 and 216–7). These forms are also found in London typically in late Neronian and Flavian contexts although they are also found in earlier phases (Davies *et al* 1994, 38 and 40). The collared flagons were gradually replaced by ring-neck flagons which are chronologically later, though there is some overlap. In London the latter occur

in Flavian and Trajanic phases (Marsh and Tyers 1978, 549; Swan 1988, 15; Davies *et al* 1994, 40). The ring-neck flagons are supplemented by other pottery forms into the late first century AD (Blumstein 1956, 276; Monaghan 1987, 217; Pollard 1988, 61).

12.2 Collared *Hofheim*-type flagons

Blumstein's original classification identified seven types of collared or cup-mouthed flagons, Types A-B-C-D-E and II and III (Fig 2) which are comparable to examples found at *Hofheim* in a context dated AD 40–51 and from *Camulodunum* dated AD 43–68 (Ritterling 1913, 278–80; Hawkes and Hull 1947, 244; Blumstein 1956, 274; Going 1987, 32). The type is recorded from Southwark and classified as 1A (Marsh and Tyers 1978, 547–8) while Monaghan's regional study classified the type as 1E5 (Monaghan 1987, 50). From the 164 examples found in 1955, 141 were deemed complete enough to provide a detailed classification, however, a complete profile was unfortunately not achievable. Blumstein also highlighted through her analysis the rigid set of specifications that the flagons conformed to whilst still allowing for some variation between the various types (1956, 274). The flagon remains also provided valuable information related to the manufacturing process which demonstrated the 'assembly line' characteristics of producing separate bodies, necks and template formed handles which were subsequently bonded together at the leather-hard stage of the drying process (Blumstein 1956, 274; Davies *et al* 1994, 38).

The UARG assemblage consisted of 169 collared flagons of all types, represented by rim sherds no matter how small and flagon tops with part, or all of the neck surviving. The total figure includes eight new or unusual variants for site 056 (Figs 16 and 17). Quantification analysis has shown that Blumstein's Type D (1956, 274) was the dominant collared flagon represented in the UARG assemblage.

Blumstein's Type II which she described as a 'variation on the cup-mouthed type' (1956, 274) are rare forms, only two being identified (Fig 2). The UARG assemblage contains only four examples. Monaghan classified the type as 1E3 with flaring collar and they are dated AD 45/70–70/100 (Monaghan 1987, 50). The type is generally found in pre-Flavian contexts. Similar flagon types to Blumstein's Type II in different fabrics are known from Colchester (Symonds and Wade 1999, 331, fig 6.14). Blumstein's Type III has a central bulge on the collar (Fig 2) (1956, 276), and is similar in form to *Camulodunum* Type 143 (Hawkes and Hull 1947, pl LXI). Thirty-eight examples were recovered by UARG. The villa at Lullingstone has produced some Hoo ware items. They are consistent with Blumstein's cup-mouthed Type II and collared transitional form Type III (1956, 274 and 276) in Pollard's Fabric 47 (Pollard 1987, 192 and 215).



Fig 14. A selection of the kiln bar fragments, UARG assemblage (© David Applegate)



Fig 15. Some wasters from site 056, UARG assemblage (© David Applegate)

12.3 Ring-neck flagons

Blumstein referred to this form type as 'screw-necks' and classified them as Type IV (1956, 276) after comparing them to *Camulodunum* Types 154 and 155 (Hawkes and Hull 1947, pl LXII) and Richborough 35 (Bushe-Fox 1926, pl XXIII; Going 1987, 32–3), both based on *Hofheim* Type 52 (Ritterling 1913, 280–3). All of the vessels of Blumstein's Type IV present amongst the UARG assemblage I have described as being of the ring-neck variety using Webster's CBA student guide (Webster 1976, 10). The type is recorded from Southwark and classified as 1B (Marsh and Tyers 1978, 547–8). The UARG assemblage includes 196 examples of ring-neck flagons represented by rim sherds and flagon tops with part or all of the neck surviving (Figs 15 and 21). I have classified the UARG assemblage using Marsh and Tyers forms 1B1 and 1B2 (Marsh and Tyers 1978, 549). 18 examples of form 1B1 and 178 of form 1B2 are represented. The Blumstein report describes a total of only 13 specimens from the 1955 assemblage. Whilst some of these vessels can be regarded as quite early (forms 1B1) the chronological implication of the majority of the ring-neck flagons represented (forms 1B2) being slightly later in date than the collared types is suggestive of continued activity at site 056 into the later first century.

12.4 Disc-mouth flagons

Blumstein classified examples of disc-mouth flagons as her Type V (1956, 276) and compared them to *Camulodunum* Type 149 (Hawkes and Hull 1947, pl LXI) and Richborough 204 (Bushe-Fox 1932, pl XXXIII) both based on *Hofheim* Type 55 (Ritterling 1913, 283, Abb.64, 285). Both Monaghan and Marsh and Tyers refer to this as a rare form (Marsh and Tyers 1978, 551; Monaghan 1987, 50); my own data accords with this view. Only two specimens were recorded by Blumstein (1956, 276) and the UARG only recovered five examples (Fig 18).

Similar examples of the types amongst the UARGs' assemblage are published by Pollard (1988, fig 15, 36), Marsh and Tyers (1978, 552, fig 233 ID1), Seager Smith *et al* (2011, fig 44, 589), Lyne (2011, 267, fig 7, 74) and Symonds and Wade (1999, 336, fig 6.19).

12.5 Flagon bases

The number of flagon bases found by UARG was large (541 examples), 370 of these were fragmented but 171 were complete. Allowing for the fragmented bases, even if we halved the figure we are still left with a minimum total of 356 flagon bases. Blumstein recorded 243 examples (1956, 273). The majority of bases recovered by UARG were consistent with those described by Blumstein (1956, 274). Monaghan classified this type as Class 1E0.3 (with a well-made square footring) and another smaller, slightly later type Class 1E0.4 (Monaghan 1987, 53). Both types are represented amongst the UARG assemblage although Class 1E0.3 is dominant.

In addition to this Blumstein identified a high number of flagon bases (82) with a series of three swirls that she described as a 'triskele swirl' on the basal interior (Figs 2 and 19) (1956, 274). However, Blumstein incorrectly attributed this to the potter scooping out the surplus moist clay with the fingers (1956, 274). An assessment of Hoo ware from London also noted this distinctive swirl and provided an alternative to Blumstein's suggestion. This focused on the shape and incised nature of the marks which were probably made by a rag attached to a stick to soak up excessive clay and slurry to aid drying time and to avoid firing problems (Davies *et al* 1994, 38).

Using one of the recovered bases I tried putting my fingers in the marks to see if by rotating the fingers it would be possible to achieve these marks, I concluded that the marks could not have been made using the fingers. The use of a tool of some description is therefore correct and it demonstrates a high degree of knowledge and technical ability. On the other hand it is notable that only a proportion of the bases have this feature. The same swirl pattern is also present on a similar proportion (162) of the bases from the assemblage found by UARG (see Appendix).

12.6 Flagon handles

Blumstein recorded the use of two and three ribbed handles only in her report (Blumstein 1956, 275). On the several viewings I made of the assemblage at Maidstone Museum I could not find any evidence of four ribbed handles. The UARG assemblage not only included a large number of two ribbed (162) and three ribbed (327) handles but also included a small, yet significant number of four ribbed examples (36) which can now be added to the record for site 056. Whilst these four ribbed handles are a new discovery for this particular site, a published flagon comparable to Blumstein's Type III in Pollard's Fabric 47 from Lullingstone Villa is illustrated with a four ribbed handle (Pollard 1987, 215, fig 67 no 24).

Collared flagons with four ribbed handles (most in other fabrics) are also known from Richborough (Bushe-Fox 1932, pl XXXII) and Eccles (Detsicas 1977, 31, fig 3.2) with a more recent example found at Coldswood Road in Thanet (Egging Dinwiddy and Schuster 2009, 109, 114).

Examination of the flagon handles has demonstrated that many were poorly applied to the flagon necks and body leading to failure and detachment during the firing process. Many exhibit signs of flaking, blistering and over-firing consistent with wasters from a kiln (Fig 15).

The three ribbed handle was by far the most popular choice. The diverse range of all these handle types prompted me to illustrate an assortment of the profiles (Fig 20). I also measured the widths of all these handles, and this information can be found in the accompanying Appendix. The major problem associated with many of the detached handle fragments found by UARG is that we cannot be sure which forms they are from, but they

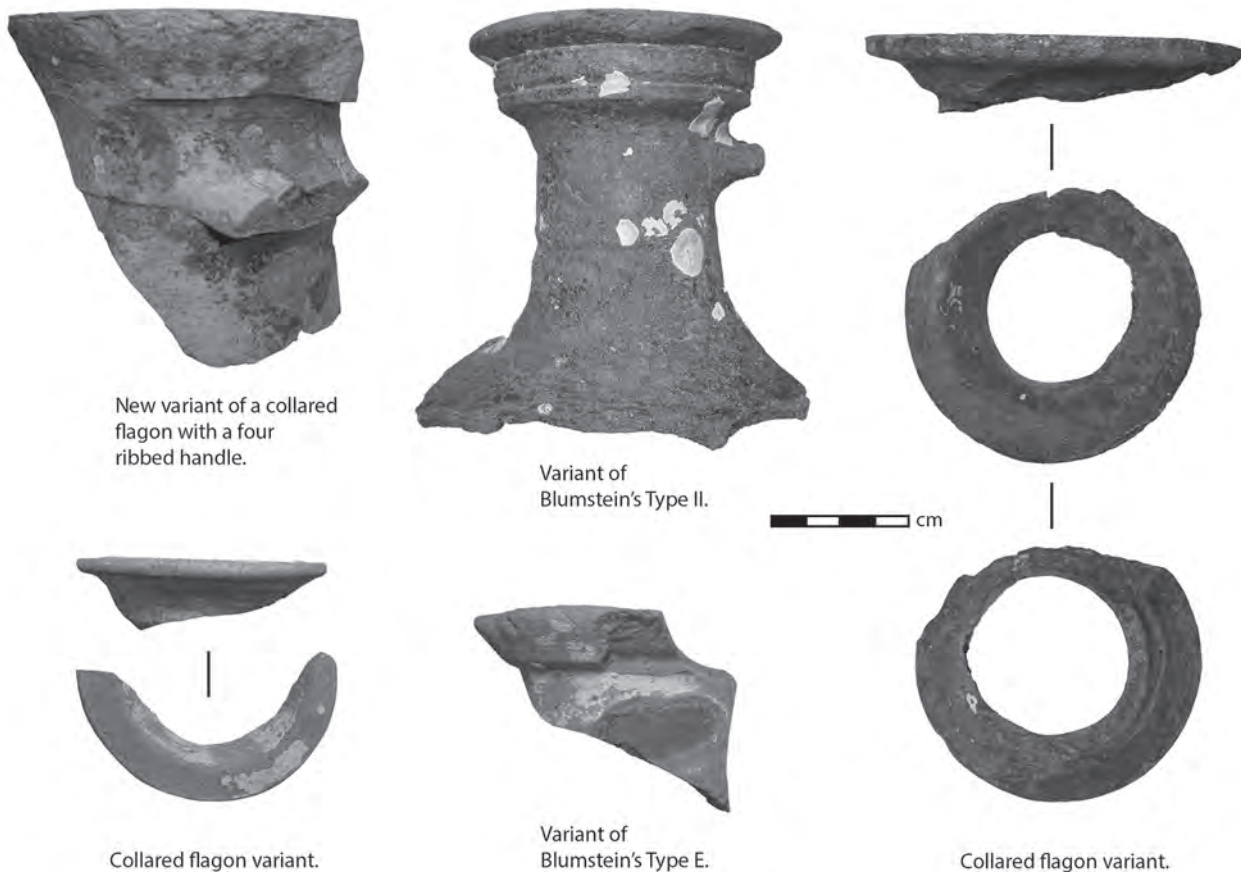


Fig 16. Collared flagon variants from site 056, UARG assemblage (© David Applegate)

are nevertheless still an important aspect of the quantified analysis.

The size of some of the handles and flagon rims is also suggestive that some vessels may have been two handle examples. Monaghan's study did not identify any evidence from the region for two handle flagons, but he speculated that 'it would not be out of keeping with the Claudio-Neronian manufacture at Hoo' (Monaghan 1987, 48) and he left a Class 1C open for possible future discoveries (1987, 48). Whilst no direct evidence was identified amongst the UARG assemblage to confirm the presence of a two handle form, the dimensions of some flagon rims and handles are highly suggestive that they could have been. The largest rim diameter recorded by Blumstein was 9.5cm (1956, 277) but all the classes of collared flagon apart from Type B examples amongst the UARG assemblage include a small number of vessels with a rim diameter between 10 and 14cm with one exceptional example of a Type C with an 18cm diameter rim.

Subsequent excavations at Damhead Creek have in recent years revealed a number of two handled flagons and *lagenae* in Hoo fabrics (Griffin *et al* 2004, 41) and an example from Westhawk Farm near Ashford in fabric R17 (fine orange Upchurch/Hoo fabric) is dated AD 70–150 (Lyne 2008, 209 and 218–9).

12.7 Other forms

The UARG also found a number of other forms many of which were in Hoo ware and consistent with the pottery found in 1955 (Fig 21 and Appendix). The dominant form amongst these items was the cordoned bowl equivalent to MON 4F3, *Camulodunum* 220B (Hawkes and Hull 1947, pl LXXIV; Monaghan 1987, 126) and Richborough 275 (Bushe-Fox 1932, pl XXXVIII; Blumstein 1956, 276). This is a native inspired form and accords with some Thompson D1-1 types (Thompson 1982, 299) but in a wholly Romanized fabric.

Other forms are represented. Using Monaghan's typology (Monaghan 1987) they include: s-profile MON 4A, footring MON 4B, high-waisted MON 4C, everted rim MON 4D, bead rimmed MON 4E, carinated MON 4G and 4H, shallow MON 4I and fine cordoned bowls MON 4J (Monaghan 1987, 112, 118, 122, 124, 128, 130, 132).

The assemblage also yielded a number of jars. These include narrow necked MON 3A, bead rimmed MON 3E and 3F, everted rimmed MON 3H, and lid-seated MON 3L types, along with some fragments of shell-tempered storage jars MON 3D (Monaghan 1987, 76, 79, 84, 88, 94, 108). The latter show a chevron design known from many Kentish sites including Broomhey Farm (Miles 2004, 323 and 325), Springhead (Seager Smith *et al* 2011,

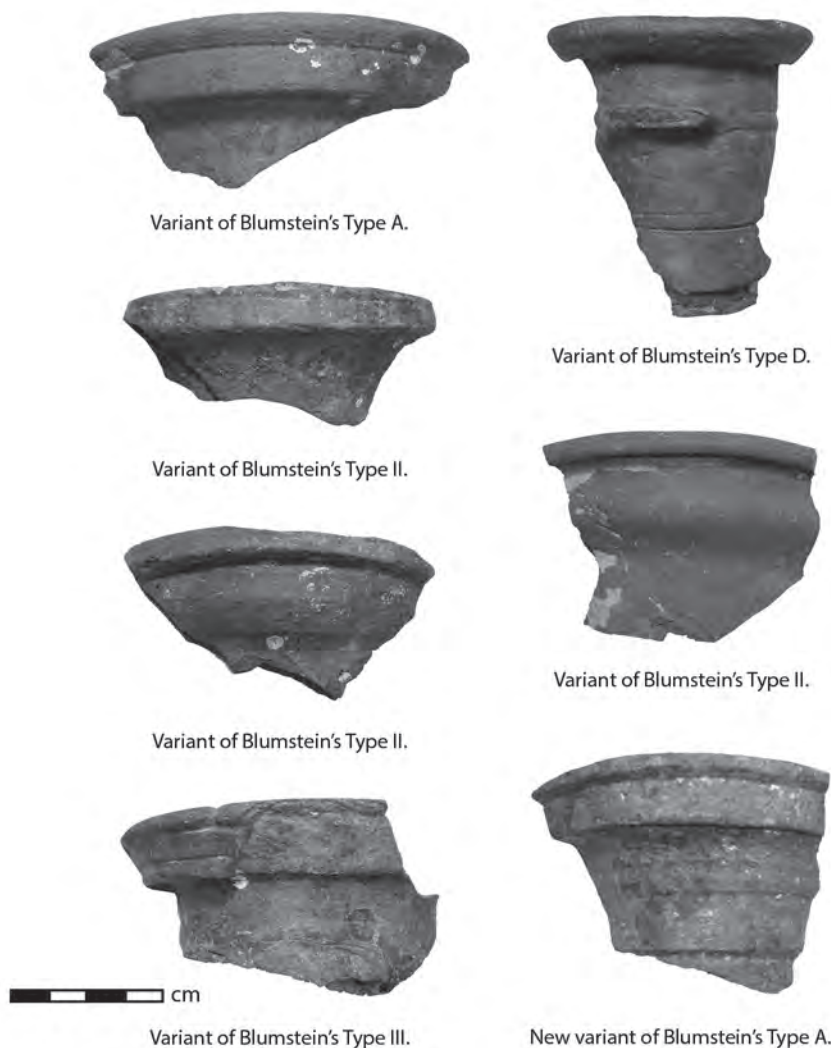


Fig 17. Collared flagon variants from site 056, UARG assemblage (© David Applegate)

89, fig 31, 378) and Greenhithe (Detsicas 1966, 172).

Beakers included globular types MON 2H2 (Monaghan 1987, 70) and Richborough 250 and 285 (Bushe-Fox 1932, pl XXXV and pl XXXVIII; Pollard 1988, 61), butt-beaker types MON 2B2 and *Camulodunum* 112–6 (Hawkes and Hull 1947, pl LVII) with rouletted decoration and some with white or cream slip, which in itself is rare (Fig 22, A) (Pollard 1988, 175), and a biconical beaker MON 2G1 (Monaghan 1987, 61 and 68). The butt-beakers are consistent in date with the collared flagons, being chronologically part of the earlier production (Davies *et al* 1994, 40).

No examples of painted Upchurch ware were found by UARG. The Blumstein assemblage did include one of these very rare vessels (Fig 22, B) MON 4B4.1 (Blumstein 1956, 276; Monaghan 1987, 119 and 174; Pollard 1988, 60–1; Seager Smith *et al* 2011, 48; Noël Hume 2001, 20–1). Other forms found by UARG included a probable fragment from a rare cup of MON

6C, platters MON 7A and 7C, dishes MON 5B and 5C and other rare forms including a number of lids MON 12 and a fragment from a strainer MON 11 (Monaghan 1987, 138, 140, 156, 158, 164, 166).

Many of the non-flagon forms discovered by the UARG at site 056 were clearly inspired by Gallo-Belgic, indigenous 'Belgic' (Aylesford-Swarling) and samian wares (Monaghan 1987, 39–40; Pollard 1988, 175).

12.8 Samian ware

The samian ware comprised five fragments; the majority were of second century AD date. Two of the sherds came from *in situ* contexts, the others were stray finds. Three were from mould-decorated Drag. form 37 bowls (not illustrated here) and one base sherd possibly from a Drag. form 18/31 dish. These four were almost certainly manufactured in Central Gaul (Webster 1996, 33, 47). One of the Drag. 37 bowls (Applegate 2012, fig 28a) has Oswald's figure Type 52a which is described by him



Fig 18. Disc-mouth flagons from site 056, UARG assemblage (© David Applegate)

as a 'marine monster' (Oswald 1936–7; Steven Willis (University of Kent) pers. comm.). Another sherd from a Drag. 37 (Applegate 2012, fig 28b) which came from an *in situ* context is probably a product manufactured by Cinnimus which is dated to *c* AD 135–55. The ovolo is similar to two types, B18 and B24 that are illustrated in Rogers' series (Rogers 1974; Steven Willis, pers. comm.). The close dating of this sherd is demonstrable of continued activity at site 056. Also present was a rim fragment probably from a Drag. 18 or 18R platter with a grooved lip and possibly of South Gaulish origin. According to Oswald and Pryce this form is characteristic of earlier examples of Claudian date (Oswald and Pryce 1920, 181–3; Webster 1996, 32).

13. A Lack of Mortaria

An interesting observation related to the UARG Hoo assemblage is the fact that no mortaria were discovered on the numerous site visits made by the group. I believe this was the case with the 1955 assemblage and it is an anomaly which given the highly Romanized nature of the flagons is difficult to explain, but points to the tendency for specialized forms such as fine wares, flagons and mortaria to be produced on occasions at separate localities. The recently discovered kiln material is indicative of an industrial site and archaeological evidence for occupation close by (*cf* Section 2.3 above) is suggestive that the workers perhaps lived near to the working area and that food preparation was carried out away from the site which could possibly explain the complete lack of domestic mortaria. The absence of mortaria may also be attributed to the fact that they are a relatively rare form during the early Roman period



Fig 19. Flagon base interior with swirl grooves from site 056, UARG assemblage (© David Applegate)

becoming more common later (Hartley 2006, 16; Steven Willis, pers. comm.). Another alternative is that both surveys have missed any mortaria that may have been eroded out but this seems unlikely.

The manufacture of specialized forms such as flagons required certain skills and they were often produced alongside other specialized forms such as mortaria and so there was a tendency for workshops to be producing both forms (Hartley 2006, 15; Johnson *et al* 2012). In terms of production however, mortaria it would appear, were not part of the output of forms produced at site 056. Indeed, Monaghan's extensive regional study could find

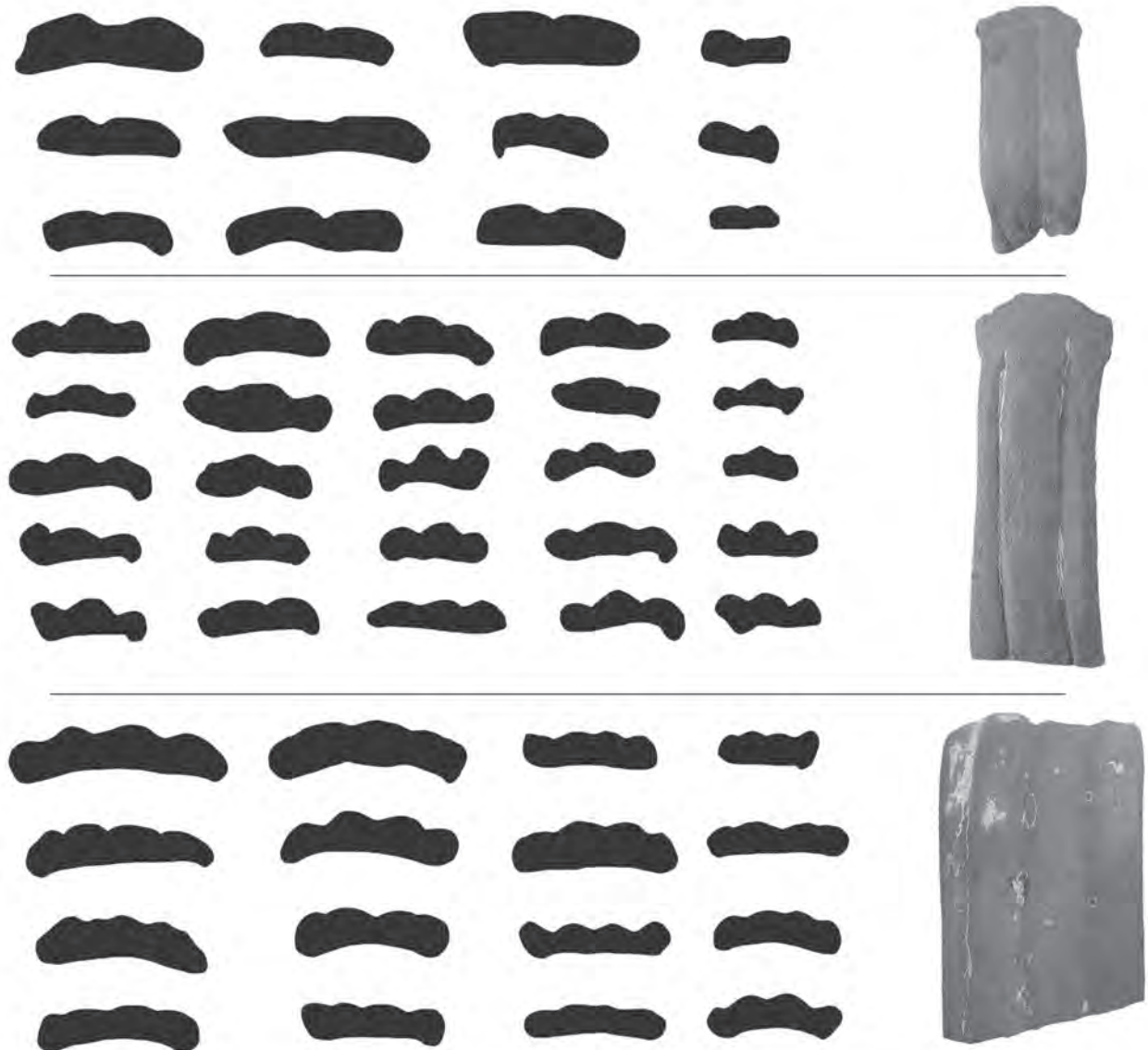


Fig 20. Two, three and four ribbed handle profiles from site 056, UARG assemblage; scale: 1:2 (© David Applegate)

no evidence of mortaria production in the North Kent marshes (Monaghan 1987, 44, 160; Pollard 1988, 176).

The early production of wall-sided and flanged mortaria is, however, attested from the wasters discovered at Eccles in the Medway Valley (Detsicas 1977, 25–8; Tomber 2006, 97) and production in Kent in the second century AD (Hartley 1972, 136–9). Mortaria were also manufactured in London at Moorgate in the Walbrook Valley and significantly perhaps, many appear to have been exported to North Kent (Seeley and Drummond-Murray 2005, 145–6). Subsequent excavations at neighbouring Damhead Creek have also produced evidence of mortaria production in the form of wasters in a rare fabric (R8) (Griffin *et al* 2004, 44). The UARG have also discovered under-fired examples of this fabric at another intertidal site, site 050 (UARG 1999, 11).

14. Evidence of Longevity

There is growing evidence that a Hoo ware tradition continued on until the mid-third century AD (Griffin *et al* 2004, 48). North Kent White-slipped ware (NKWS) (Davies *et al* 1994, 38; Seager Smith *et al* 2011, 50) is perceived as being a later variant which utilized a ‘virtually identical’ fabric to that of Hoo ware and a large assemblage of this type of fabric is known from Damhead Creek (Griffin *et al* 2004, 48). Examples have also been found at Springhead in late second century AD contexts (Andrews 2011, 80; Seager Smith *et al* 2011, 48, 99, fig 40, nos 519, 107, fig 47, nos 645 and 651, fig 54 no 817). The NKWS re-classification was established because the forms could not be paralleled among the first century AD Blumstein assemblage (Davies *et al* 1994, 40). I can confirm from my study that there are no identifiable forms of NKWS present amongst the UARG assemblage.

15. Present Condition of the Site

In recent years the site has become difficult to visit due to silting by estuarine alluvium which has re-concealed both sherds and features recorded between 1996 and 2003. Accordingly, few finds have been observed or recovered from the Hoo site since 2003, the last being recorded by Ian Jackson in January 2012 when a number of stray Hoo ware sherds were noted in a couple of pools at low tide, together with an *in situ* base fragment of a ring-neck flagon and a few body sherds (Ian Jackson pers. comm. autumn 2014). The site is now totally inaccessible due to the deposition of soft highly treacherous mud. Ian Jackson advises that much erosion of the islets has taken place since the recording published here, however, some peat layers and the channel feature on the east side of the islets was still visible in 2012.

16. Conclusion

The two assemblages of pottery discovered at Hoo should be seen for what they truly represent, that is the wholesale waste products from a highly productive pottery kiln(s) site. I am drawn to such a conclusion by the nature and extent of the artefactual evidence and through the careful analysis of this recovered material. Much of the pottery exhibits classic signs of flaws associated with the pottery manufacturing process. Many of the flagon handles for example, simply appear to have detached during the firing process due to a seemingly inherent tendency to apply them to the leather hard body unsatisfactorily (see too Borgers this volume, section 5.2). This can be seen on some of the recovered body sherds and flagon tops and is especially noticeable on the ring-neck flagons where the rings in some cases are clearly visible under the handle without any distortion or flattening (Fig 15). Problems associated with handles was an aspect also noted on some Hoo flagon finds made in London where the poorly applied handles had caused the wall beneath the handle to sink (Davies et al 1994, 38). The fact that many of the vessels from site 056 were not over-fired or had any other flaws, belies the fact that they were not wasters, for with a broken or detached handle they are waste. The quantity of bases with the characteristic swirl pattern has also increased in number and confirms that the two assemblages are from the same deposit and also, as Blumstein intimated, is further evidence of an individual with a characteristic technique working at the site (Blumstein 1956, 274 and 277).

The UARG assemblage has also added new evidence to the existing knowledge of the site. The Blumstein assemblage does not, for example, include any four ribbed handles while the more recent assemblage has produced 36. In addition new variants of some collared flagon types have been recorded.

The chronology of the assemblage defined by the pottery forms has been further clarified. It begins with

production soon after the Roman conquest of *c* AD 43 with collared *Hofheim* type flagons and characteristic butt-beakers; this period of production lasts until *c* AD 70/75. These forms were eventually superseded by ring-neck type flagons along with other forms which were influenced by Continental and indigenous native forms and this phase evidently continues into the last quarter of the first century and perhaps into the beginning of the second century (Blumstein 1956, 274–6; Monaghan 1987, 61 and 216–8; Swan 1988, 14–5; Davies et al 1994, 38–40).

The archaeological significance of the UARG's work at Hoo and the evidence it has imparted is testament to the Groups' diligent and careful archaeological activities. The evidence related to what one could term 'true wasters' and the small yet highly significant quantity of kiln bar and kiln wall lining, together with the two important lenses of *in situ* material from an eroding feature, is perhaps at last conclusive material, indicating that the islets on Ford Marsh were indeed the location of a specialist Romano-British pottery manufacturing site. The wasters and kiln bar would not have travelled too far from the kiln(s). Given all the aforementioned evidence examined and assembled and the significant photographic record which shows the extensive amount of material that was uncovered (Figs 6, 7 and 10) I would strongly advocate that it was a kiln site.

The early establishment of this specialist pottery manufactory soon after the Roman conquest is highly suggestive of the Continental ethnicity of the potters who were working at the site. The newly introduced range of flagon forms in a fine oxidized fabric with a white-slip had no parallel amongst the native pottery repertoire (Monaghan 1987, 216–7; Pollard 1988, 174). The idea that the enterprise was established by Continental immigrants who were perhaps supplying the military (Swan 1984, 85; Monaghan 1987, 217) is highly justifiable and the location adjacent to a tidal estuary with abundant raw materials close by and the easy facilitation for trading via sea routes also gave this location economic advantages. Military supply was perhaps the initial inspiration for this enterprise but the archaeological investigation of many Romano-British sites notably in Kent (Gerrard 2005; Mark Williams, pers. comm.) and London continue to demonstrate the regional distribution of this distinctive ware (Monaghan 1987, 209; Davies et al 1994, 38–40).

The range of forms produced at site 056 demonstrates that the potters working at Hoo were skilled artisans who knew their craft well (the handle issues aside). Blumstein referred to the 'considerable standardization in manufacturing technique' of the flagon forms (1956, 274) produced at Hoo and with this I fully concur. That said it is also evident in what they left behind that a degree of variability and perhaps experimentation was also carried out. This skill was not confined to flagon forms and the relatively small amount of other pottery found is testament to that.

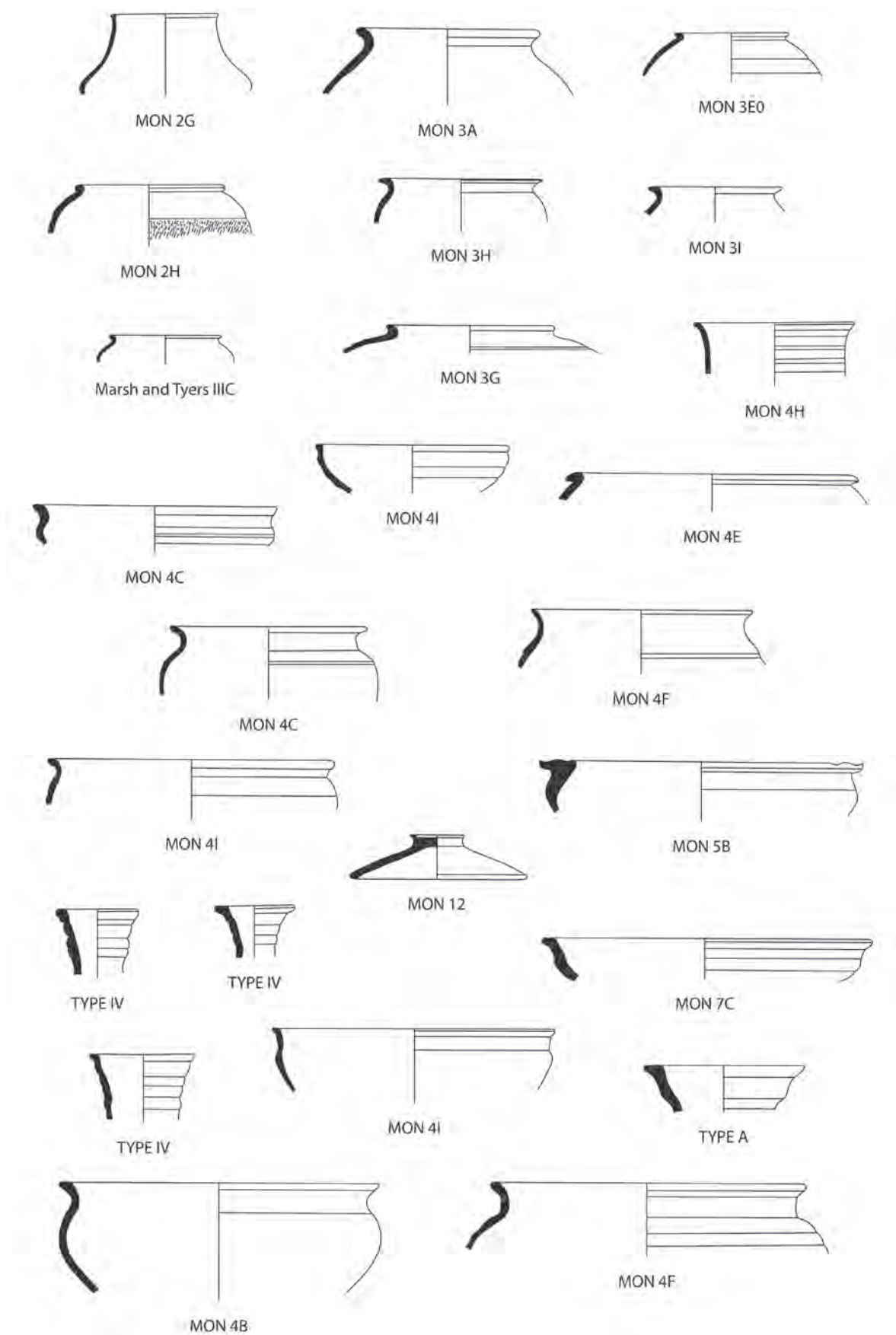


Fig 21. Other pottery forms from site 056, UARG assemblage; scale: 1:4 (© David Applegate)



Fig 22. A. The upper wall of a butt-beaker MON 2B (Monaghan 1987, 61–2) with white-cream slip and rouletted decoration, from the UARG assemblage; B. Painted Upchurch ware from the Blumstein assemblage (Blumstein 1956, 276; Monaghan 1987, 119) in Maidstone Museum; photographed by the author and reproduced with permission (© David Applegate)

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Appendix: Listing Quantifying the Typology and Attributes of the Hoo Ware Archive collected by the UARG

Kiln debris material

Number of fragments recovered: 30 (2974g)



Fig 23. The upper part of a flagon in Hoo ware with collared rim, UARG assemblage. The white circles are where barnacles had grown (© David Applegate)

10 found *in situ*, 20 unstratified
Kiln bar fragments: 14 (2118g)
Kiln lining fragments: 9 (693g)
Other kiln debris fragments: 7 (163g)

Type A flagons

Number of examples: 5 (244g) all unstratified
Percentage of all flagons recovered, by EVE: 2.03%
No slip: 1 (31g); with slip: 4 (213g)
Rim diameter 6–7cm: 1
Rim diameter 8–9 cm: 1
Rim diameter 10cm: 2
Rim diameter 12cm: 1
With 3 ribbed handle: 1
Handle type unknown: 4
Handle width 27mm: 1
Handle width unknown: 4
Waster/overfired or flawed: 5

Type B flagons

Number of examples: 3 (97g) all unstratified
EVE percentage: 1.84%
No slip: 2 (57g), with slip: 1 (40g)
Rim diameter 6–7cm: 1
Rim diameter 7–8cm: 1
Rim diameter 8–9cm: 1
With 3 ribbed handle: 1
Handle type unknown: 2
Handle width 34mm: 1
Handle width unknown: 2
Waster/overfired or flawed: 3

Type C flagons

Number of examples: 23 (661g) all unstratified
EVE percentage: 6.36%
No slip: 12 (185g), with slip: 11 (476g)

Rim diameter 6–7cm: 4
 Rim diameter 8–9cm: 5
 Rim diameter 9–10cm: 5
 Rim diameter 11–12cm: 5
 Rim diameter 12–13cm: 1
 Rim diameter 13–14cm: 2
 Rim diameter 18cm: 1
 Neck length 6–7cm: 1
 Neck length unknown: 22
 With 2 ribbed handle: 1
 With 3 ribbed handle: 1
 Handle type unknown: 21
 Handle width 37mm: 1
 Handle width 49mm: 1
 Handle width unknown: 21
 Waster/overfired or flawed: 15, others: 8

Type D flagons

Number of examples: 70 (2988g), 1 recovered *in situ*; 69 unstratified
 EVE percentage: 28.89%
 No slip: 38 (773g), with slip: 32 (2215g)
 Rim diameter 6–7cm: 14
 Rim diameter 7–8cm: 15
 Rim diameter 8–9cm: 32
 Rim diameter 9–10cm: 4
 Rim diameter 11–12cm: 2
 Rim diameter 12–13cm: 1
 Rim diameter 14cm: 2
 Neck length 6–7cm: 7
 Neck length 7–8cm: 3
 Neck length unknown: 60
 With 2 ribbed handle: 1
 With 3 ribbed handles: 14
 Handle type unknown: 55
 Handle width 27mm: 1
 Handle width 28mm: 1
 Handle width 30mm: 2
 Handle width 32mm: 3
 Handle width 33mm: 3
 Handle width 35mm: 2
 Handle width 37mm: 1
 Handle width unknown: 57
 Waster/overfired or flawed: 42, others: 28

Type E flagons

Number of examples: 18 (658g) all unstratified
 EVE percentage: 9.79%
 No slip: 7 (107g), with slip: 11 (551g)
 Rim diameter 6–7cm: 8
 Rim diameter 7–8cm: 4
 Rim diameter 8–9cm: 3
 Rim diameter 10cm: 2
 Rim diameter 12cm: 1
 Neck length 5–6cm: 4
 Neck length unknown: 14
 With 3 ribbed handle: 6
 Handle type unknown: 12
 Handle width 21mm: 2
 Handle width 25mm: 2
 Handle width 26mm: 1
 Handle width 28mm: 1
 Handle width unknown: 12
 Waster/overfired or flawed: 12, others: 6

Type II flagons

Number of examples: 4 (258g), all unstratified
 EVE percentage: 1.59%
 No slip: 1 (37g), with slip: 3 (221g)
 Rim diameter 7–8cm: 1
 Rim diameter 12–13cm: 3
 Neck length 6–7cm: 1
 Neck length unknown: 3
 With 2 ribbed handle: 1
 With 3 ribbed handle: 1
 Handle type unknown: 2
 Handle width 27mm: 1
 Handle width 50mm: 1
 Handle width unknown: 2
 Waster/overfired or flawed: 4

Type III flagons

Number of examples: 38 (1288g) all unstratified
 EVE percentage: 16.55%
 No slip: 19 (465g), with slip: 19 (823g)
 Rim diameter 6–7cm: 3
 Rim diameter 7–8cm: 8
 Rim diameter 8–9cm: 20
 Rim diameter 9–10cm: 5
 Rim diameter 11–12cm: 1
 Rim diameter 13–14cm: 1
 Neck length 5–6cm: 1
 Neck length 6–7cm: 3
 Neck length unknown: 34
 With 3 ribbed handle: 6
 Handle type unknown: 32
 Handle width 27mm: 1
 Handle width 28mm: 1
 Handle width 30mm: 2
 Handle width 31mm: 1
 Handle width 38mm: 1
 Handle width unknown: 32
 Waster/overfired or flawed: 13, others: 25

Type IV flagons

Number of examples: 196 (5034g)
 11 recovered *in situ*; 185 unstratified
 IB1 variants: 18 (728g)
 IB2 variants: 178 (4306g)
 EVE percentage: 53.95%
 No slip: 91 (1886g), with slip: 105 (3148g)
 Rim diameter 4–6cm: 11
 Rim diameter 6–7cm: 86
 Rim diameter 7–8cm: 49
 Rim diameter 8–9cm: 32
 Rim diameter 9–10cm: 2
 Rim diameter unknown: 16
 (Note that in the following the rim is not included in the ring count)
 Examples with 1 ring: 5
 Examples with 2 rings: 9
 Examples with 3 rings: 38
 Examples with 4 rings: 29
 Examples with 5 rings: 6
 Unknown number of rings: 109
 Neck length 3–4cm: 6
 Neck length 5–6cm: 12
 Neck length 6cm: 4
 Neck length 8cm: 1
 Neck length unknown: 173

With 2 ribbed handle: 10
 With 3 ribbed handle: 7
 With 4 ribbed handle: 1
 Handle type unknown: 178
 Handle width 19mm: 1
 Handle width 22mm: 1
 Handle width 25mm: 2
 Handle width 27mm: 1
 Handle width 28mm: 1
 Handle width 30mm: 1
 Handle width 31mm: 3
 Handle width 32mm: 1
 Handle width 33mm: 1
 Handle width 34mm: 3
 Handle width 39mm: 1
 Handle width 42mm: 1
 Handle width unknown: 179
 Waster/overfired or flawed: 106, others: 90

Type V flagons

Number of examples: 5 (343g), all unstratified
 EVE percentage: 4.47%
 No slip: 4 (277g), with slip traces: 1 (66g)
 Rim diameter 4–5 cm: 1
 Rim diameter 5–6 cm: 4
 Neck length 4–5cm: 2
 Neck length unknown: 3
 With 2 ribbed handle: 2
 Handle type unknown: 3
 Handle width 29mm: 1
 Handle width 39mm: 1
 Handle width unknown: 3
 Hole diameter 15mm: 1
 Hole diameter 17mm: 1
 Hole diameter 18mm: 1
 Hole diameter 19mm: 1
 Hole diameter 35mm: 1
 Waster/overfired or flawed: 3, others: 2

New flagon types or unusual variants

Number of examples: 8 (280g), 1 recovered *in situ*, 7 unstratified
 EVE percentage: 2.94%
 With slip: 5 (208g), no slip: 3 (72g)
 Rim diameter 7–8cm: 2
 Rim diameter 8–9cm: 3
 Rim diameter 9–10cm: 1
 Rim diameter 11–12cm: 1
 Rim diameter 12–13cm: 1
 Neck length 7–8cm: 1
 Neck length unknown: 7
 With 3 ribbed handle: 1
 With 4 ribbed handle: 1
 Handle type unknown: 6
 Handle width 33mm: 1
 Handle width 52mm: 1
 Handle width unknown: 6
 Wasters/Overfired or flawed: 7, others: 1
 Items include the following:

Two variants of Blumstein's Type A where the collar is straight-sided; one of these, however, has an internal profile more like a Type B.

Two unusual variants of Blumstein's Type D. One has a wide squat-angled rim which protrudes 7mm beyond the

collar, while the other is a variant of Cam 140 (Hawkes and Hull 1947; cf fig 6.13 no 319, Symonds and Wade 1999).

A variant of Blumstein's Type D with raised cordon 5mm wide defined by grooves either side and 16mm below collar, broken only by the handle; another similar cordon is 30mm below this one, again defined by grooves either side; the rim is chunky and quite rounded. Similar to Chelmsford J1 1.1 (Going 1987, fig 16).

A variant of Blumstein's Type E with an unusual straight-sided collar.

A new variant of Blumstein's Type II and three very similar cup-mouthed variants.

A variant of Blumstein's Type III but with two distinct grooves on the collar similar to Eccles fig 3.2 no 52 (Detsicas 1977) and Colchester CAR 10, fig 6.13 no 333 (Symonds and Wade 1999).

A new variant of a collared flagon with a four ribbed handle. This piece could not be ascribed to a type as the rim is very degraded.

Unclassifiable flagon neck sherds

Number of sherds: 160 (6789g)
 11 recovered *in situ*, 149 unstratified
 No slip: 90 (3215g), with slip: 70 (3574g)
 Waster/overfired or flawed: 96, others: 64

Unclassifiable flagon vessel body sherds

Number of sherds: 205 (5454g)
 54 recovered *in situ*, 151 unstratified
 No slip: 81 (1764g), with slip: 124 (3690g)
 Waster/overfired or flawed: 81, others: 124

Flagon bases

Number of bases: 541 (34972g), 6 found *in situ*, 535 unstratified
 Whole bases: 171; fragments from bases: 370
 Number of bases of Monaghan Type 1E0.3: 497
 Number of bases of Monaghan Type 1E0.4: 30
 Number of unclassifiable bases: 14
 Number of bases with potters swirl: 162
 Number of bases without swirl: 244
 Number of bases where it could not be established if there was or was not a swirl: 135
 With white-slip traces: 260, without slip: 281
 Base diameter 4–5cm: 4
 Base diameter 5–6cm: 10
 Base diameter 6–7cm: 61
 Base diameter 7–8cm: 165
 Base diameter 8–9cm: 77
 Base diameter 9–10cm: 128
 Base diameter 10–11cm: 43
 Base diameter 11–12cm: 29
 Base diameter 12–13cm: 1
 Base diameter not known: 23
 Footring diameter 2–3mm: 10
 Footring diameter 3–4mm: 93
 Footring diameter 5mm: 211
 Footring diameter 6mm: 105
 Footring diameter 7mm: 50
 Footring diameter 8mm: 13
 Footring diameter 9mm: 8
 Footring diameter unknown: 19
 No footring: 32
 Waster/overfired or flawed: 271, others: 270

2 ribbed handles

Number of examples: 162 (5236g)

8 recovered *in situ*, 154 unstratified

No slip: 94, with slip: 68

Handle width 17mm: 1

Handle width 19mm: 1

Handle width 20mm: 1

Handle width 22mm: 4

Handle width 23mm: 1

Handle width 24mm: 4

Handle width 25mm: 1

Handle width 26mm: 4

Handle width 27mm: 4

Handle width 28mm: 6

Handle width 29mm: 7

Handle width 30mm: 7

Handle width 31mm: 13

Handle width 32mm: 12

Handle width 33mm: 12

Handle width 34mm: 9

Handle width 35mm: 8

Handle width 36mm: 14

Handle width 37mm: 1

Handle width 38mm: 15

Handle width 40mm: 8

Handle width 42mm: 6

Handle width 43mm: 4

Handle width 44mm: 2

Handle width 45mm: 3

Handle width 46mm: 1

Handle width 48mm: 4

Handle width 49mm: 1

Handle width 50mm: 2

Handle width 52mm: 1

Handle width 55mm: 1

Handle width 56mm: 1

Handle width unknown: 3

Waster/overfired or flawed: 100, others: 62

3 ribbed handles

Total number of examples: 327 (11183g)

2 found *in situ*, 325 unstratified

No slip: 181, with slip: 146

Handle width 20mm: 2

Handle width 22mm: 5

Handle width 23mm: 4

Handle width 24mm: 4

Handle width 25mm: 9

Handle width 26mm: 7

Handle width 27mm: 14

Handle width 28mm: 18

Handle width 29mm: 14

Handle width 30mm: 30

Handle width 31mm: 29

Handle width 32mm: 34

Handle width 33mm: 31

Handle width 34mm: 29

Handle width 35mm: 21

Handle width 36mm: 21

Handle width 37mm: 13

Handle width 38mm: 11

Handle width 39mm: 7

Handle width 40mm: 6

Handle width 42mm: 3

Handle width 43mm: 2

Handle width 45mm: 3

Handle width 46mm: 1

Handle width 47mm: 1

Handle width 48mm: 1

Handle width 51mm: 1

Handle width unknown: 6

Waster/overfired or flawed: 181, others: 146

4 ribbed handles

Number of examples: 36 (1774g), 1 found *in situ*, 35 unstratified

No slip: 14, with slip: 22

Handle width 29mm: 1

Handle width 32mm: 1

Handle width 33mm: 3

Handle width 34mm: 3

Handle width 35mm: 2

Handle width 37mm: 1

Handle width 39mm: 2

Handle width 40mm: 3

Handle width 41mm: 6

Handle width 43mm: 5

Handle width 45mm: 1

Handle width 47mm: 2

Handle width 48mm: 1

Handle width 49mm: 2

Handle width 53mm: 1

Handle width 55mm: 2

Waster/overfired or flawed: 21, others: 15

Monaghan Type 2 Beakers, MON 2B (butt beakers)

Examples in Hoo ware: 21, only body sherds, no rims, (261g), all unstratified

No slip: 17, white/cream slip traces: 4

Rouletted decoration: 21

Date: All can be dated as mid- to late first century AD

Wasters, overfired or flawed: 8, others: 13

Monaghan Type 2 Beakers, MON 2G (carinated/biconical beakers with bead rim)

Examples in Hoo ware: 1 (20g), unstratified

No slip; rim diameter 8cm

Date: AD 40/50–70–100

Monaghan Type 2 Beakers, MON 2H (large neckless globular beakers, with grooves, cordons and rouletting)

Examples in Hoo ware: 5 (89g), unstratified

With slip: 1, no slip: 4

Rouletted decoration: 5

Rim diameter 9cm: 1

Date: Mid- to late first century AD

Rim diameter 10cm: 3

Date: AD 70/80–100

Rim diameter 11cm: 1

Date: AD 70/80–100

Waster, overfired or flawed: 2, others: 3

Monaghan Type 2 Beakers, MON 2I (ovoid or globular beakers with everted rim)

This small group includes Monaghan Types 2I, 2IO and Marsh and Tyers Type IIIC

Number of examples: 11 (84g), all unstratified

No slip: 11, with slip: none

Rim diameter 7cm: 1 (MON 2I globular beaker with everted rim)

and template formed girth grooves; this form has Gallo-Belgic affinities; the fabric is very fine)

Fabric: Monaghan N2/4b (reduced)

Date: AD 43–60

Rim diameter 8cm: 1

Fabric: Hoo ware

Date: Late first century AD

Rim diameter 8.5cm: 1

Fabric: Hoo ware

Date: Late first century AD

Rim diameter 9cm: 1

Fabric: Hoo ware

Date: Late first century AD

Rim diameter 10cm: 6

Fabric: Hoo ware

Date: Mid- to late first century AD

Rim diameter 12cm: 1

Fabric: Hoo ware

Date: Late first century AD

Wasters, overfired or flawed: 2, others: 9

Monaghan Type 3 Jars, MON 3A (narrow necked jar)

Examples in Hoo ware: 1 (54g), unstratified

Rim diameter 14cm

Date: Mid- to late first century AD

Wasters, overfired or flawed: 1

Monaghan Type 3 Jars, MON 3D (storage jars)

Examples, all in fabric Monaghan H1/4h: 3 (252g), all unstratified

Rim diameter 26cm: 1; no visible traces of decoration

Date: AD 40/50–150

Rim diameter unknown: 2; chevron decoration

Date: AD 40/50–150

Monaghan Type 3 Jars, MON 3E (bead rim jars)

Examples: 11 (261g), 1 found *in situ*, 10 unstratified

Rim diameter 10cm: 3

Fabric: Hoo ware: 3; date: AD 50/70–150

Rim diameter 14cm: 2

Fabric: Monaghan F1/1hb: 1

Fabric: Monaghan S1/4b: 1

Date: AD 10–100

Rim diameter 16cm: 2

Fabric: Hoo ware: 1

Unknown reduced fabric: 1

Date: mid- to late first century AD

Rim diameter 18cm: 1

Fabric: Hoo ware: 1

Date: AD 10/40–150

Rim diameter 20cm: 2

Fabric: Monaghan S1/6b: 1

Unknown reduced fabric: 1

Date: AD 10–100

Rim diameter 24cm: 1

Fabric: Shell tempered: 1

Date: mid- to late first century AD

Wasters, overfired or flawed: 4, others: 7

Monaghan Type 3 Jars, MON 3F (bead rim jars with hooked rim)

Number of examples: 8 (237g), all unstratified

Rim diameter 10cm: 1

Fabric: Hoo ware: 1

Date: Mid- to late first century AD

Rim diameter 12cm: 1

Fabric: Hoo ware: 1

Date: Mid- to late first century AD

Rim diameter 14cm: 1

Fabric: Hoo ware: 1

Date: AD 40–150/170

Rim diameter 16cm: 1

Fabric: Monaghan F2/1: 1

Date: AD 40–150/170

Rim diameter 18cm: 3

Fabric: Hoo ware: 1

Fabric: Monaghan H1/4h: 1

Date AD 50–90

Fabric: Monaghan S1/1: 1

Date: AD 40–150/170

Rim diameter 26cm: 1

Fabric: Monaghan H1/4h: 1

Date: AD 70–140

Wasters, overfired or flawed: 2, others: 6

Monaghan Type 3 Jars, MON 3G (faceted jars)

Number of examples: 6 (250g), all unstratified

Rim diameter 11cm: 1

Fabric: Hoo ware: 1

Date: AD 70–90

Rim diameter 12cm: 1

Fabric: Hoo ware

Date: AD 50–70

Rim diameter 14cm: 1

Fabric: Hoo ware (misfired)

Date: Mid- to late first century AD

Rim diameter 16cm: 1

Fabric: Monaghan S1/4

Date: AD 10–100

Rim diameter 18cm: 1

Fabric: Monaghan S3/1 (or variant): 1

Date: Mid- to late first century AD

Rim diameter 20cm: 1

Fabric: Monaghan S1/1

Date: Mid- to late first century AD

Wasters, overfired or flawed: 3, others: 3

Monaghan Type 3 Jars, MON 3H (everted rim jars)

Number of examples: 5 (73g), all unstratified

With white or cream slip traces: 1, no slip: 4

Rim diameter 10cm: 3

Fabric: Hoo ware: 2

Reduced fabric: 1

Date: Mid- to late first century AD

Rim diameter 12cm: 1

Fabric: Hoo ware

Date: Mid- to late first century AD

Rim diameter 14cm: 1

Fabric: Hoo ware

Date: AD 50/70–100

Wasters, overfired or flawed: 1, others: 4

Monaghan Type 3 Jars, MON 3I (wide mouth everted rim jars)

Number of examples: 2 (55g), both unstratified

Rim diameter 10cm: 1, everted rim jar, squat rounded form

Fabric: Hoo ware

Date: AD 50–80

Rim diameter 19cm: 1, wide mouth everted rim jar
 Fabric: Monaghan S1/5
 Date: Mid- to late first century AD

Monaghan Type 3 Jars, MON 3L (lid seated jars)

Number of examples: 3 (61g), 1 found *in situ*, 2 unstratified
 White slip: 1, no slip: 2
 Rim diameter 10cm: 1, white-slip traces
 Fabric: Hoo ware
 Date: Late first century AD
 Rim diameter 14cm: 1
 Unknown reduced fabric
 Date: AD 50–70
 Rim diameter 18cm: 1
 Fabric: Monaghan S1 variant
 Date: AD 50–140
 Wasters, overfired or flawed: 1, others: 2

Monaghan Type 4 Bowls, MON 4A (s-profile bowls)

Number of examples: 5 (112g), 1 found *in situ*, 4 unstratified
 Rim diameter 12cm: 1
 Fabric: Hoo ware
 Date: Mid- to late first century AD
 Rim diameter 14cm: 1
 Fabric: Hoo ware
 Date: AD 40/50–90
 Rim diameter 18cm: 1
 Fabric: Hoo ware
 Date: AD 110–200
 Rim diameter 22cm: 1
 Fabric: Hoo ware
 Date: Mid- to late first century AD
 Rim diameter 24cm: 1
 Fabric: Hoo ware
 Date: AD 40/50–90
 Wasters: Overfired or flawed: 2, others: 3

Monaghan Type 4 Bowls, MON 4B (footring bowls)

Number of examples: 6 (272g), all unstratified
 With white/cream slip: 3, no slip: 3
 Rim diameter 10cm: 1 (slight traces of white/cream slip)
 Fabric: Hoo ware
 Date: AD 45–90
 Rim diameter 11cm: 1 (traces of cream-slip)
 Fabric: Hoo ware
 Date: Mid- to late first century AD
 Rim diameter 16cm: 2 (one example has an inward leaning neck)
 Fabric: Hoo ware
 Date: AD 40–90
 Rim diameter 18cm: 1
 Fabric: Hoo ware
 Date: Mid- to late first century AD
 Rim diameter 22cm: 1 (traces of cream slip)
 Fabric: Hoo ware
 Date: Mid- to late first century AD
 Wasters, overfired or flawed: 4, others: 2

Monaghan Type 4 Bowls, MON 4C (high waisted bowls)

Number of examples: 12 (244g), 2 found *in situ*, 10 unstratified
 Rim diameter 8cm: 1
 Fabric: Hoo ware
 Date: AD 50–100
 Rim diameter 10cm: 1

Fabric: Hoo ware
 Date: AD 50–100
 Rim diameter 12cm: 2
 Fabric: Hoo ware
 Date: AD 40/50–70
 Rim diameter 14cm: 2
 Fabric: Hoo ware: 1
 Sand tempered fabric (reduced): 1
 Date: AD 50–100
 Rim diameter 16cm: 1
 Fabric: Hoo ware
 Date: AD 50–100
 Rim diameter 18cm: 3
 Fabric: Hoo ware
 Date: AD 40/50–100
 Rim diameter 24cm: 2
 Fabric: Hoo ware
 Date: Mid- first century AD
 Wasters, overfired or flawed: 6, others: 6

Monaghan Type 4 Bowls, MON 4D (bowls with everted rim)

Number of examples: 2 (13g), both unstratified
 Rim diameter 10cm: 2
 Fabric: Hoo ware
 Date: AD 50–70
 Wasters, overfired or flawed: 2

Monaghan Type 4 Bowls, MON 4E (bead rimmed bowls)

Number of examples: 2 (51g), both unstratified
 Rim diameter 14cm: 1, fairly straight sided vessel
 Fabric: Hoo ware
 Date: Late first to early second century AD
 Rim diameter 20cm: 1
 Fabric: Hoo ware
 Date: AD 10–50/70
 Wasters, overfired or flawed: 2

Monaghan Type 4 Bowls, MON 4F (cordoned bowls)

Number of examples: 33 (914g), all unstratified
 White/cream slip traces: 3, no slip: 30
 Rim diameter 11cm: 1
 Fabric: Hoo ware
 Date: Mid- to late first century AD
 Rim diameter 12cm: 1
 Fabric: Hoo ware
 Date: Mid- to late first century AD
 Rim diameter 14cm: 9
 Fabric: Hoo ware
 Date: Mid- to late first century AD
 Rim diameter 16cm: 1
 Fabric: Hoo ware
 Date: Mid- to late first century AD
 Rim diameter 18cm: 6
 Fabric: Hoo ware
 Date: Mid- to late first century AD
 Rim diameter 19cm: 1
 Fabric: Hoo ware
 Date: AD 40–70
 Rim diameter 20cm: 1
 Fabric: Hoo ware
 Date: AD 40–70
 Rim diameter 22cm: 1
 Fabric: Hoo ware

Date: Mid- to late first century AD
 Unclassifiable body sherds: 12
 Fabric: Hoo ware
 Date: Mid- first century to early second century AD
 Wasters, overfired or flawed: 15, others: 18

Monaghan Type 4 Bowls, MON 4G (carinated bowls)

Number of examples: 2 (17g), both unstratified
 Rim diameter 14cm: 1, carinated bowl
 Fabric: Monaghan N2/1b (reduced)
 Date: AD 70–130
 Rim diameter 24cm: 1, carinated bowl with high waist
 Fabric: Hoo ware
 Date: AD 50/70–100
 Wasters, overfired or flawed: 1, others: 1

Monaghan Type 4 Bowls, MON 4H (carinated bowl, continental style)

Number of examples: 1 (17g) unstratified
 Rim diameter 12cm: 1 (three subtle cordons are evident)
 Fabric: Hoo ware
 Date: Late first century AD

Monaghan Type 4 Bowls, MON 4I (shallow bowls)

Number of examples: 3 (91g), all unstratified
 Rim diameter 14cm: 1 (form has Gallo-Belgic affinities)
 Fabric: Hoo ware
 Date: Mid- to late first century AD
 Rim diameter 19cm: 1
 Fabric: Hoo ware
 Date: AD 40–70
 Rim diameter 22cm: 1 (form has Gallo-Belgic affinities)
 Fabric: Hoo ware
 Date: AD 45–70
 Waster, overfired or flawed: 1, others: 2

Monaghan Type 4 Bowls, MON 4J (fine cordoned bowls)

Number of examples: 2 (14g), both unstratified
 Slip traces: 2
 Body sherd (no rim): 1
 Fabric: Hoo ware
 Date: AD 43/50–110/120
 Body sherd (no rim): 1
 Fabric: Monaghan N1/1bs (or variant)
 Date: AD 43/50–110/120
 Wasters, overfired or flawed: 1, others: 1

Monaghan Type 5 Dishes, MON 5B (fine flanged dishes)

Number of examples: 4 (175g), all unstratified
 White slip: 1, no slip: 3
 Rim diameter unknown: 1
 Fabric: unknown micaceous
 Date: AD 60–70/130
 Rim diameter 20cm: 2
 Fabric: Hoo ware: 1, white-slip traces
 Date: Mid- to late first century AD
 Fabric: Mon N2/1b: 1
 Date: Late first century AD
 Rim diameter 24cm: 1 (vessel has internal ledge, perhaps for a lid)
 Fabric: Hoo ware
 Date: Late first century AD
 Waster, overfired or flawed: 3, other: 1

Monaghan Type 5 Dishes, MON 5C (pie dishes)

Number of examples: 2 (42g), both unstratified
 Rim diameter 14cm: 1
 Fabric: Hoo ware
 Date: AD 110–240
 Rim diameter 20cm: 1
 Fabric: Monaghan S1/6
 Date: AD 120/150–210
 Waster, overfired or flawed: 1, other: 1

Monaghan Type 6 Cups, MON 6C (cups)

Number of examples: 1 (6g), unstratified
 Rim diameter 12cm: 1 (perhaps imitating samian form Drag. 27)
 Fabric: Hoo ware
 Date: AD 80–120

Monaghan Type 7 Platters, MON 7A (platters with bead rim and smooth curving wall)

Number of examples: 3 (63g), all unstratified
 Diameter unknown: 3
 Fabric: Hoo ware
 Date: AD 43–120/140
 Wasters, overfired or flawed: 3

Monaghan Type 7 Platters, MON 7C (platter with facetted wall)

Number of examples: 1 (22g), unstratified
 Slip traces: 1
 Rim diameter 24cm: 1 (form has Gallo-Belgic affinities)
 Fabric: Hoo ware
 Date: AD 43–70

Monaghan Type 11 Strainers, MON 11B (strainers)

Number of examples: 1 (9g) unstratified
 Diameter unknown: 1
 Fabric: Hoo ware
 Date: AD 40–70
 Waster, Overfired or flawed: 1

Monaghan Type 12 Lids, MON 12 (lids)

Number of examples: 9 (354g), all unstratified

Form MON 12E lids:

Lid diameter 13cm: 1
 Fabric: Hoo ware
 Date: Mid- to late first century AD
 Lid diameter 16cm: 1
 Fabric: Hoo ware
 Date: Mid- to late first century AD
 Lid diameter 18cm: 1
 Fabric: Hoo ware
 Date: Mid- to late first century AD
 Lid diameters unknown: 4
 Fabric: Hoo ware
 Date: Mid- to late first century AD

Form MON 12H lids:

Lid diameter 18cm: 1
 Fabric: Hoo ware
 Date: Mid- to late first century AD
 Lid diameter 20cm: 1 (high angled wall)
 Fabric: Hoo ware
 Date: Mid- to late first century AD
 Wasters, overfired or flawed: 4, others: 5

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Roman pottery production at the site of Vervoz, Belgium, between the mid-first century AD and the end of the second century AD

Barbara Borgers

1. Introduction

This paper explores the potential of ceramics as a source for understanding social and technological traditions focusing on the pottery production site of Vervoz. Excavations at the site, which lies in the Meuse region of Belgium, between 1962–72, revealed important evidence for pottery manufacture during the Roman period, consisting of seven workshops, production debris and pottery, dated to between the mid-first century and the end of the second century AD. By using a compositional approach combining typo-morphological study with thin section analysis aspects of the raw materials and production technology of this pottery are investigated. The results indicate both threads of continuity and meaningful discontinuity in Roman potters' choice of raw materials and technological traditions at the site over a period of 150 years. These technological practices are likely to reflect the social organisation of the Roman potting groups.

Traditional history on the Roman period in Belgium has promoted an image of an era that brought about wholesale changes in population and radical disruptions of social and economic life. Moreover, it has attributed these changes to the emergence of urban life and associated craft and commercial activity. Belgian-made Roman ceramics (that is types displaying characteristics that are conventionally described and understood as Roman) are common in Roman contexts, and they display a great variety of shape and fabric. They are largely undecorated and appear to have had a wide range of standardized forms. Traditional approaches to Roman ceramics have emphasized attributes, such as vessel form and surface treatment, and have concentrated on pottery sequence (Vanvinckenroye 1991; Hanut 2010a). In traditional appraisals, the pottery assemblages are

studied in hand specimen, and divided into imported fine wares and the coarse regional wares (these being the more utilitarian pottery types produced and distributed within a region). The fine wares have received most attention.

A number of compositional analyses have highlighted the potential of mineralogical and chemical data as a means of detecting possible sources of raw materials used for the manufacture of imported fine wares on the one hand (Bocquet *et al* 1992; Monsieur *et al* 2007), and regional wares produced in the Meuse River basin (Hemptinne-Stöcklin and Brulet 1983), on the other. However, these compositional groupings have been limited to a few sites and knowledge of their meaning in terms of raw materials, technology and cultural affiliations is incomplete. As a result, relatively little is known about how pottery was made and how the craft was organized. Inspired by this the present paper explores the potential of ceramics as a source for comprehending the social and cultural history of production; this is via a case study of manufacture during the mid-first century to the end of the second century AD at Vervoz. The paper aims towards an understanding of the specific steps and processes involved in local manufacturing traditions and how the craft was organized at the site of Vervoz. A compositional approach is used, combining typo-chronology with thin section analysis, whereby the typological and technological characteristics of the ceramics are examined in detail.

2. The Archaeological Site

The site of Vervoz lies 39 km south-west of Liège on the Meuse River, and 60 km south of Tongres (Tongeren), the capital of the *Civitas Tungrorum* (Fig 1). The Roman period site is located on a hillside, and lies

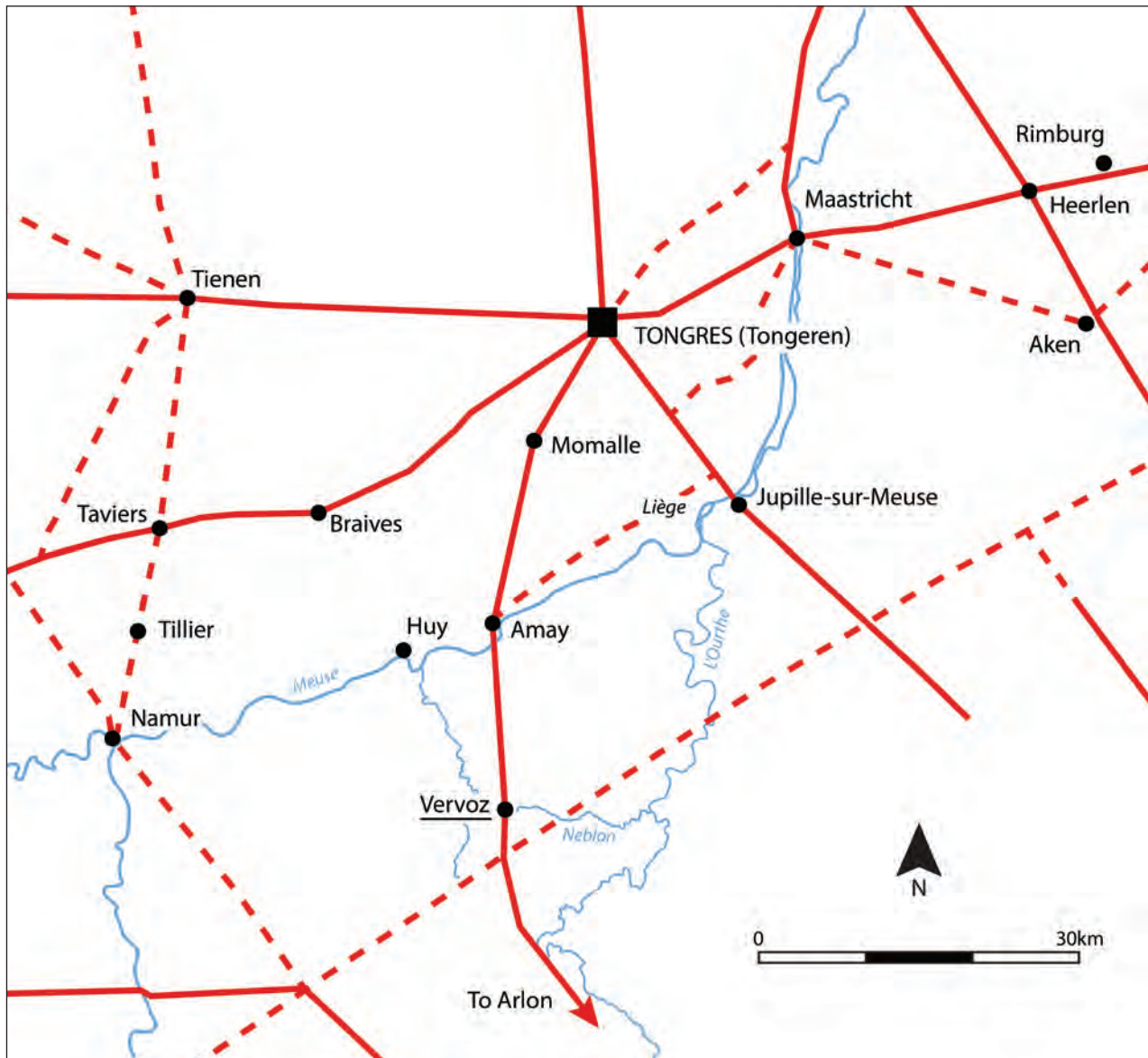


Fig 1. The location of Vervoz in relation to other Roman period settlements (after Mertens 1965 *La Belgique Romaine sous le Haut-Empire* and van Kerckhove et al 2014. Drawn by Lloyd Bosworth)

approximately 300m west of the centre of the modern village and in close proximity to the Néblon River. The site is located in the Condroz region, an area shaped by regional folding associated with the main Caledonian and Hercynian deformations, and characterized geologically by sandstone ridges and limestone depressions. Clay-rich material here was formed by *in situ* weathering of the limestone and sandstone strata. Soils are generally sandy and alluvial deposits occur along the main streams in the area.

3. The Excavations

The Roman site was explored by archaeological work around forty years ago; this revealed a significant centre of

vicus type. This work began when a funerary monument, surrounded by six tombs, was found and archaeologists decided to investigate the area in more detail through full survey and aerial photography. J. Willems and a team of the 'Cercle Archéologique Hesbaye-Condroz' conducted several seasons of excavations during the 1960s (Willems *et al* 1966; 1967; Willems 1969; Willems and Lauwerijs 1974; Docquier and Willems 1983). They observed that the Roman small town of Vervoz developed around the mid-first century AD along the road from Tongres to Arlon (Fig 2). The first structures comprised timber strip-houses, which were aligned at right-angles to the street. At the end of the first century some were cleared for larger public buildings, including a market place with silos (*horrea*) and a tavern (*taverna*). Other

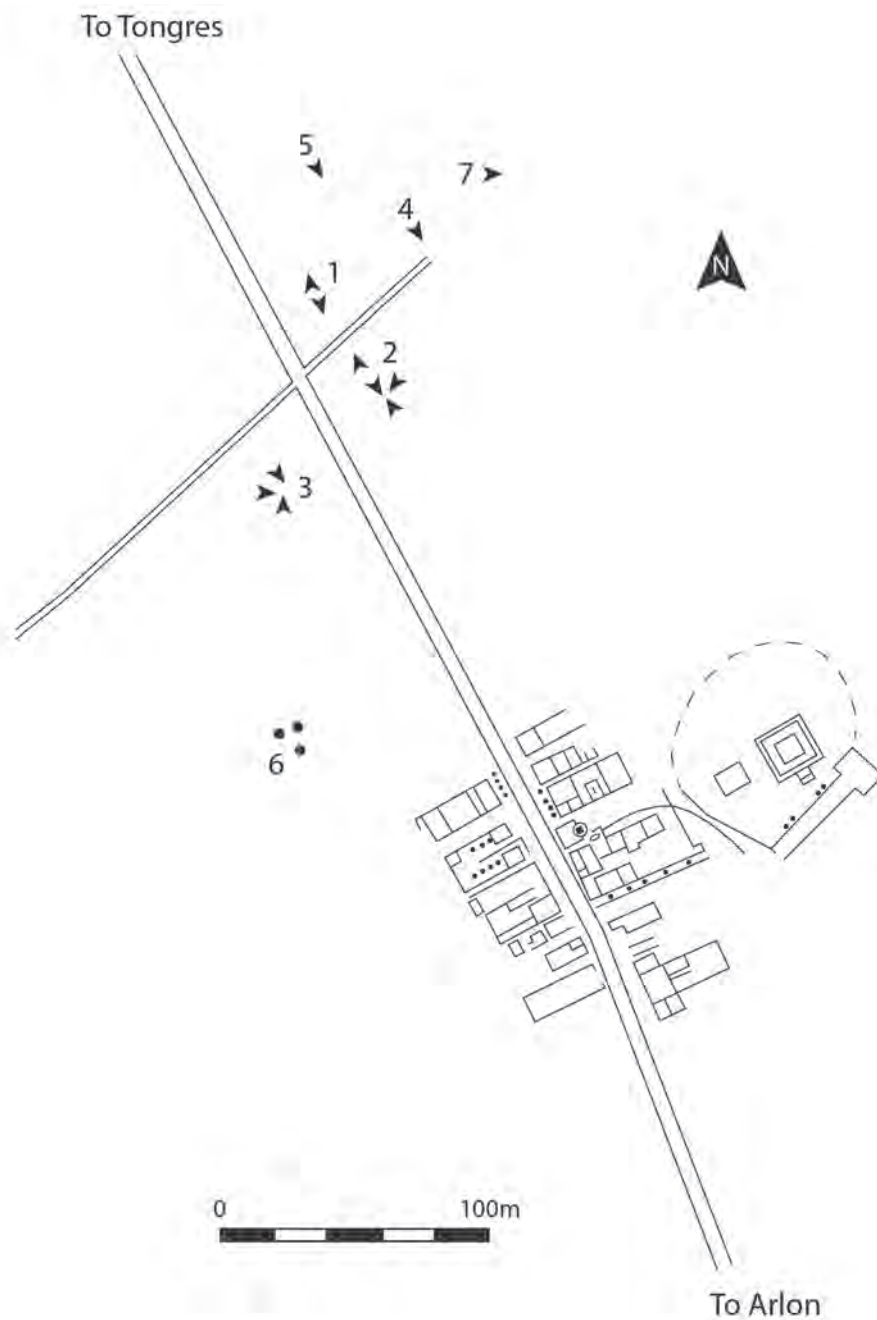


Fig 2. The site at Vervoz showing the location of seven identified workshops (after Willems and Lauwerijs 1974, 158, fig 1). The arrows indicate the orientation of the stoke-holes of the kilns; the orientation of the kilns from Workshop 6 is not known

public buildings comprised two temples (cf. Witvrouw and Witvrouw 1975–6), baths (*thermae*), and a *mansio*, where travellers could be fed and find a room for the night, and obtain vehicles or animals for the next leg of their journey. It would appear that the local limestone was an important resource in Roman times, as it was the primary material used in a range of activities related to the construction of funerary monuments and temples. The soft limestone was also used for the preparation of plaster and stucco, which decorated the baths. Important evidence for pottery manufacture, consisting of 15 kilns

and a large amount of pottery wasters, was found on the north-east periphery of the core of the small town. The kilns were located on both sides of the main road, and their activities have been dated to between the mid-first century and the end of the second century AD by the pottery styles and associated *sigillata* (samian) wares. Of these; 14 kilns operated during the first century, whilst the activity of the 15th kiln has been dated to the end of the second century (Willems *et al* 1966; Willems and Lauwerijs 1974; Deru 1994).

The excavators, concentrating on aspects of a pottery

Table 1. Pottery workshops, products and thin section sampling at Vervoz. Continuity in the use of raw materials (grey cells) and technological practices (bold and underlined); VV = Vanvinckenroye type

	Shape / Form type	Pottery sequence	Fabric Groups/era			Thin Section Samples
			Early	Mid	Later	
WS 1	Flagon	Hofheim 50–51; Deru CRU 114	1			2
	Carinated bowl	Gose 307; Deru B14	1			
	Samples total					
WS 2	Flagon	Hofheim 50–51; Deru CRU 114	1			21
	Amphora	Gauloise 15	1			
	Honey jar	VV 356	1			
	Handmade dolium	Gose 357–358	<u>3</u>			
	Wheel-thrown urn	VV 50–51	2			
	Gallo-Belgic plate	Deru A41	4			
	Gallo-Belgic flask	Deru BT6	4			
	Gallo-Belgic beaker	Deru P1–P12	4			
	Samples total					
WS 3	Handmade dolium	Gose 357–358	2, <u>3</u>			32
	Wheel-thrown urn	VV 50–51	2			
	Flagon	Deru CRU 102, 103	4			
	Amphora	Deru CRU 202	4			
	Jar with everted rim	VV465–466	<u>5</u>			
	Carinated bowl	Deru P54.3, P48.3	6			
	Samples total					
WS 4	Flagon	Deru 103, 106		4		16
	Gallo-Belgic flask	Deru BT7–8		4		
	Biconical beaker	Deru P55		4		
	Jar with everted rim	VV465–466		4		
	Handmade dolium	Gose 357–358		<u>7</u>		
	Samples total					
WS 5	Wheel-thrown urn	VV 50–51		2		5
	Gallo-Belgic flask	Deru BT7–8		4		
	Samples total					
WS 6	Wheel-thrown urn	VV 50–51		2		11
	Amphora	Mosan 1		4		
	Mortarium	VV 336–337, 345–347		4		
	Bowl, horizontal rim	Deru B36–37		4		
	Jar	Deru P29.3		4		
	Flagon	VV 419–429, 423–424		4		
	Dolium	Gose 357–358		<u>7</u>		
	Samples total					
WS 7	Bowl	VV 531–532			8	33
	Beaker	VV 18–21			8	
	Flagon	Gose 388; VV 423–426			9	
	Plate	VV 564–565			8	
	Lid-seated jar	VV 478–479, 508–509			10	
	Lid-seated jar	VV 478–479, 508–509			<u>11</u>	
	Mortarium	VV 336–337, 347–348			12	
	Samples total					
Total of pottery samples						120
Kiln structure samples	dome				A	6
	oven-floor				B	
Total of kiln fragments						6
Total number of samples						126



Fig 3. The remains of Kiln 2, comprising a cylindrical pier (from Willems *et al* 1966, 55)

sequence, established threads of continuity between the kilns, which operated during the first century. However, the role of the last kiln remained unclear. The excavators concluded that the workshops at Vervoz existed for a short time, after which the potters left, and continued to produce their pottery elsewhere (Willems *et al* 1967). Hence, it would appear that ceramic manufacture at the site of Vervoz was mainly concentrated during the first century and revived at the end of the second century. However, this assumption does not seem to be supported by the imported fine wares at the site, which suggest that the small town flourished during the second century (Willems 1982). Hence, the question arises as to whether pottery manufacture at the site did indeed cease for about a century or whether threads of continuity can be established.

At present the site lies within pasture land for cattle and has not been built over. Since the excavations the site and its material have received little attention, in spite of its potential.

4. Evidence for Pottery Production at Vervoz

4.1 The kiln features and workshops

Publication of details of the site by the excavators did not include any focus upon the kilns themselves. As a consequence of the time that has elapsed since their discovery the task of reconstructing the nature of the kilns at Vervoz is a difficult one. Nonetheless, this has proved possible. This task has been helped by the fact that parts of the kilns are visible on the original site plans and they also appear in photos within the 1960s publications (Willems *et al* 1966; 1967; Willems 1969). Overall, they separate out into seven discrete workshops on the basis of their spatial positioning and that of the associated pottery wasters (Fig 2; Table 1).

4.2 The early Roman period

Three workshops were dated to the early Roman era. Workshop 1 included two kilns, which were horseshoe shaped in plan. Built 0.6m apart, both structures consisted

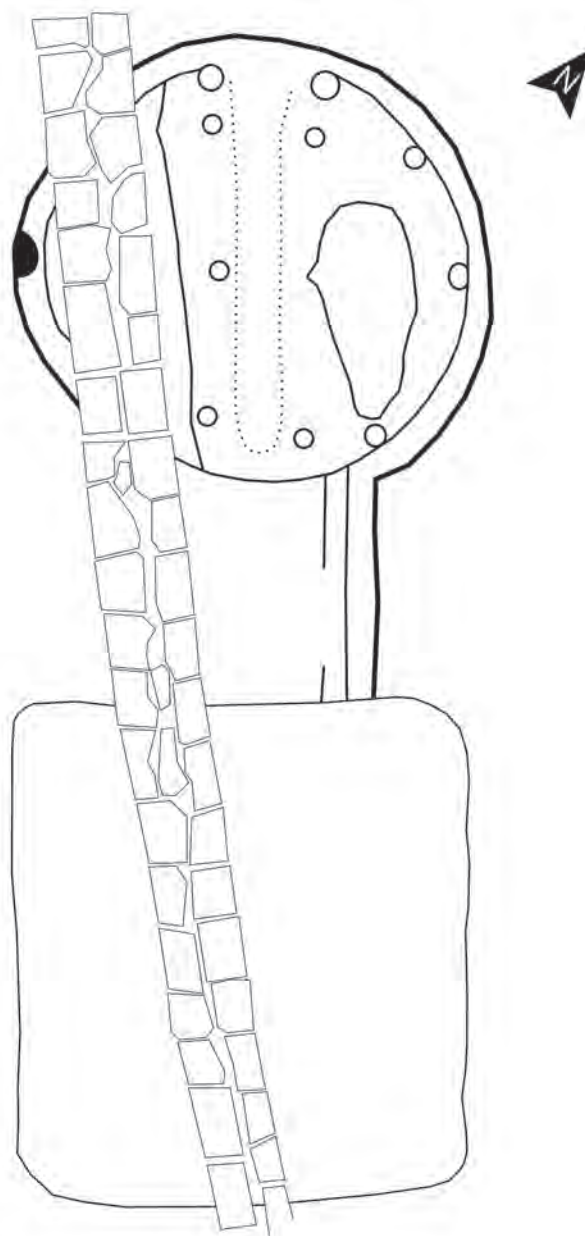


Fig 4. Drawing of an updraught kiln with clay platform (after Willems *et al* 1966); no scale is recorded

of pits dug into the ground. Their stoke-holes were oriented in a north-east and south-west direction (Fig 2). A cylindrical pier, extending into the combustion chamber from the back, was preserved in both structures (Fig 3). One kiln contained remnants of a wooden construction, which would have secured the kiln floor during the preliminary firing (Willems *et al* 1966, 53, fig 2). The cylindrical pier in both kilns would have supported a raised clay platform, which would have been essential to keep the specialized vessels away from the flames (Swan 1984). Both kilns were backfilled with large quantities of fired clay fragments, some with curved edges, which

may represent the remains of the kiln lining. The surface of these fragments was orange or grey, and in some cases vitrified. The associated pottery wasters were nearly complete. Their relatively small number may indicate that other wasters were removed and dumped elsewhere. In addition, iron scrapers were found during the excavations (Willems *et al* 1966, 72–3). However, the author did not



Fig 5. A rectangular shaped kiln with perforated oven floor (from Willems *et al* 1966, pl I, fig 1)



Fig 6. Imbrex tile impressions associated with the rectangular shaped kiln (from Willems *et al* 1966, pl II, fig 2)



Fig 7. Three over-fired pieces from clay plates, approximate lengths $11 \times 5\text{cm}$, $5 \times 4.5\text{cm}$, $8 \times 3.5\text{cm}$, and a piece of the clay roof with impressions of organic material, approximate length $10.5 \times 8.5\text{cm}$ (Barbara Borgers)



Fig 8. Pre-Flavian flagons manufactured in Workshop 1 (Barbara Borgers)

find these items in the museum where all the finds from the site of Vervoz are stored.

Workshop 2 comprised four kilns, three of which were round in plan, whilst the fourth was rectangular. All the kilns were double-chambered updraught kilns. Their lowest level featured a firing pit and a lower chamber dug into 'hardpan'. In two structures, the tongue pedestal and permanent vent-holed floor was preserved (Fig 4). One kiln's stoke-hole was facing north-east, whilst the other three were grouped around a common stoke-hole (Fig 2). The rectangular kiln was originally interpreted as a pottery kiln (Willems *et al* 1966) – an interpretation that was later rejected because of its particular shape (Deru 1994). However, close examination of the published photos shows a permanently raised oven floor of solid clay with holes, as well as impressions of tiles on the soil in the immediate surroundings of the kiln (Figs 5 and 6). This is witnessed by their prints on the soil, where they were laid out for drying or firing, and which burnt after exposure to the heat from the kiln firing thus creating an enduring 'footprint'. Hence, the author is inclined to believe that this kiln was used for tile manufacture. A ditch seems to have surrounded the kiln group, but no plan of this feature was recovered. The workshop was partly destroyed by a wall, dated to the third/fourth century AD, whose extension was not examined further (Willems *et al* 1966, 60–2).

Charcoal was most common in the fills of the flues and stoke-holes of two kilns, and waster vessels included Gallo-Belgic pottery, white fine ware, coarse ware and *dolia*. A high degree of vessel completeness was noted for most wares, except for *dolia*. The waster debris also included a stone polishing tool (Willems *et al* 1966, 72–3). The evidence suggests that once the structures were abandoned, they were used for the disposal of waster material.

Workshop 3 comprised three kilns grouped around one stoke-hole (Fig 2). One was well-preserved and found with an intact oven floor with perforated vent-holes. The two other kilns appear to have been destroyed in antiquity (Willems *et al* 1966, 57–8). The excavation plan indicates that the destruction was due to the construction of a stone-built wall. However, it is not clear which kind of structure this could have been. In spite of this, near-complete items representing floor plates were found in association and may have been used for the construction of the clay platform (Fig 7). Alternatively, this kiln furniture may have been used as setters to aid the horizontal stacking of the vessels, with the aim of preventing pottery moving or collapsing during firing.

4.3 The mid-Roman period

Three workshops dated to the mid-Roman period were identified at the site. Workshop 4 comprised one round

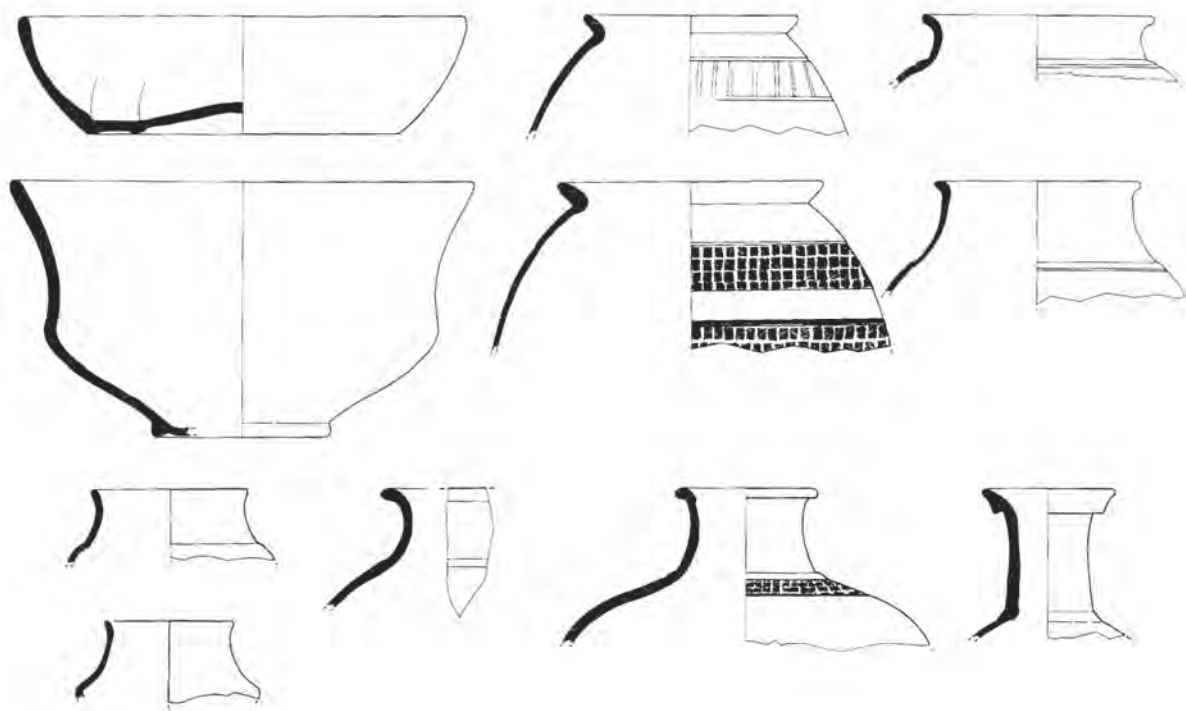


Fig 9. Gallo-Belgic pottery from Workshop 2 (Deru 1996, 278, fig. 127)

kiln structure, whose clay platform and fragments of the upper chamber wall were preserved. The archaeologists mentioned in their report that waster vessels of two different batches were found within the kiln (Willems *et al* 1966, 58). On the platform, a firing load of Gallo-Belgic pottery was found *in situ*, of which the upper layer may have been largely destroyed as a result of severe and repetitive ploughing. The wasters from the other load were found in the stoke-hole, comprising coarse tempered vessels. These sherds were friable, and had abraded rims, which suggests that they had been lying on the premises for some time.

Very few traces of the kiln of workshop 5 were preserved. It was round in plan with a cylindrical pier, and remnants of the clay platform were vitrified and distorted. Relatively few vessels were found within, including Gallo-Belgic pottery and fine white ware.

The three kilns of workshop 6 had a raised perforated clay platform, which survived in two structures, whilst small fragments of the upper chamber wall of the third were preserved, showing that it curved inwards to form a dome (Willems 1969). Large quantities of waster vessels were associated with this workshop, comprising a wide range of pottery wares. In the immediate surroundings of the grouped kilns, a pit with stored and weathered clay was found and has been preserved (Willems *et al* 1966). However, there was no record of its precise location and position relative to the clustered kilns.

4.4. The end of the second century AD

Few remnants survived of the late Roman workshop, workshop 7, at Vervoz. Nevertheless, the archaeologists reported that the structure showed evidence for repair, given that the clay lining of the kiln walls had been refaced (Willems *et al* 1966, 56). Fragments of *mortaria* were used in the construction of the tongue support.

Charcoal was found in the fill of the flue of the kiln. The kiln contained a wide range of pottery wares, with a lack of sherd joins, representing highly incomplete forms. This suggests that the kiln was used for the disposal of waster vessels when it was abandoned. The nature of the sherds also suggests that there may have been some time-gap between the two activities.

5. Pottery Wasters

5.1 Wasters and their contexts

Relating dumps of pottery to specific kilns at the site of Vervoz is problematic, as it by no means follows that pottery found in the kiln was fired there. Indeed, it may well have come from another kiln, dumped in a disused one when the firing had failed for convenience. Nevertheless, any mixing of production and waste deposits is more likely to have occurred between adjacent kilns within the same group rather than across groups and therefore does not affect this broad distinction.



Fig 10. Wheel-thrown lid-seated jars and bowls, including (top centre) a dolium rim (Barbara Borgers)

5.2 The early Roman period

The vessels associated with workshop 1 comprised Roman pottery including flagons and carinated bowls (Table 1). Rhythmic grooves on the interior of the base of the vessels indicated that they were wheel-thrown. The flagons had a globular body. Some had a narrow conical neck and out-curved lip; others had a nearly cylindrical neck with cupped mouth and stepped lip (Fig 8; Borgers *et al* 2013, 159, fig 4). The bowls were characterised by a short shoulder and everted rim. When the vessels were leather-hard, their shapes were defined and completed on the wheel. For instance, the base of the flagons was trimmed, and handles attached to the body.

The kiln wasters associated with workshop 2 comprised Gallo-Belgic pottery, white fine ware, including flagons, honey jars and amphorae, and *dolia* (Table 1). Following Deru's typo-morphological classification, it can be said that workshops 1 and 2 operated between AD 40–70 (Deru 1994; 1996, 277–8).

Gallo-Belgic pottery comprised the usual forms, including platters, flasks, beakers, lids and carinated bowls. The platters had a roundly curved, concave wall, which meets the flat base at something of an angle externally, and without an internal offset. Sometimes they had a thickened rim; one was stamped with the die 'ATISSO' (Willems *et al* 1966, 98, pl 18). The flasks were narrow-mouthed with flattened shoulder, one bold cordon and a tall tapered neck and groove under the foot. The globular and ovoid beakers had an everted rim and decorated bands, variously demarcated by grooves of oblique or nearly vertical rows of stabs. Another type

of surface decoration consisted of two zones bearing contrasted patterns. The highest was usually cross-hatched; the lower finely rouletted (Fig 9). Typical for this pottery was its fine black polished surface, resulting in a matt texture. Defects included fire clouding, where black patches contrasted heavily with the lighter-toned surface colour, and incomplete reduction firing, which resulted in a dull light grey to whitish surface.

White fine ware included flagons, jars and amphorae (Table 1). The types of flagons were similar to the ones of workshop 1. There were several types of jars: some, also known as honey jars, had a slightly everted rim and two handles; others had a horizontal stamped rim. Some vessels were overfired, which resulted in an orange to deep pink surface colour. Yet others were accidentally fired in reducing atmosphere. A substantial number of handles had detached from the rest of the vessel, suggesting that the vessels may have been subjected to too rapid cooling at the end of the firing process (Peña 2007, 33).

One amphora was associated with the waster vessels, and its shape was clearly carefully fashioned (Table 1; Borgers *et al* 2013, 159, fig 4). It was thrown in sections and incorporated a pointed foot where it showed converging irregularities on the interior. The different parts were joined at the leather-hard stage and then turned to a smooth finish. Its deep pink colour, both on the surface and throughout the core, suggests that it had been over-fired.

Also included in the waster assemblage were large sherds of *dolia*. They were coarsely tempered with light-coloured sub-angular inclusions and handmade, whilst the rim was wheel-thrown. Some sherds had blackened

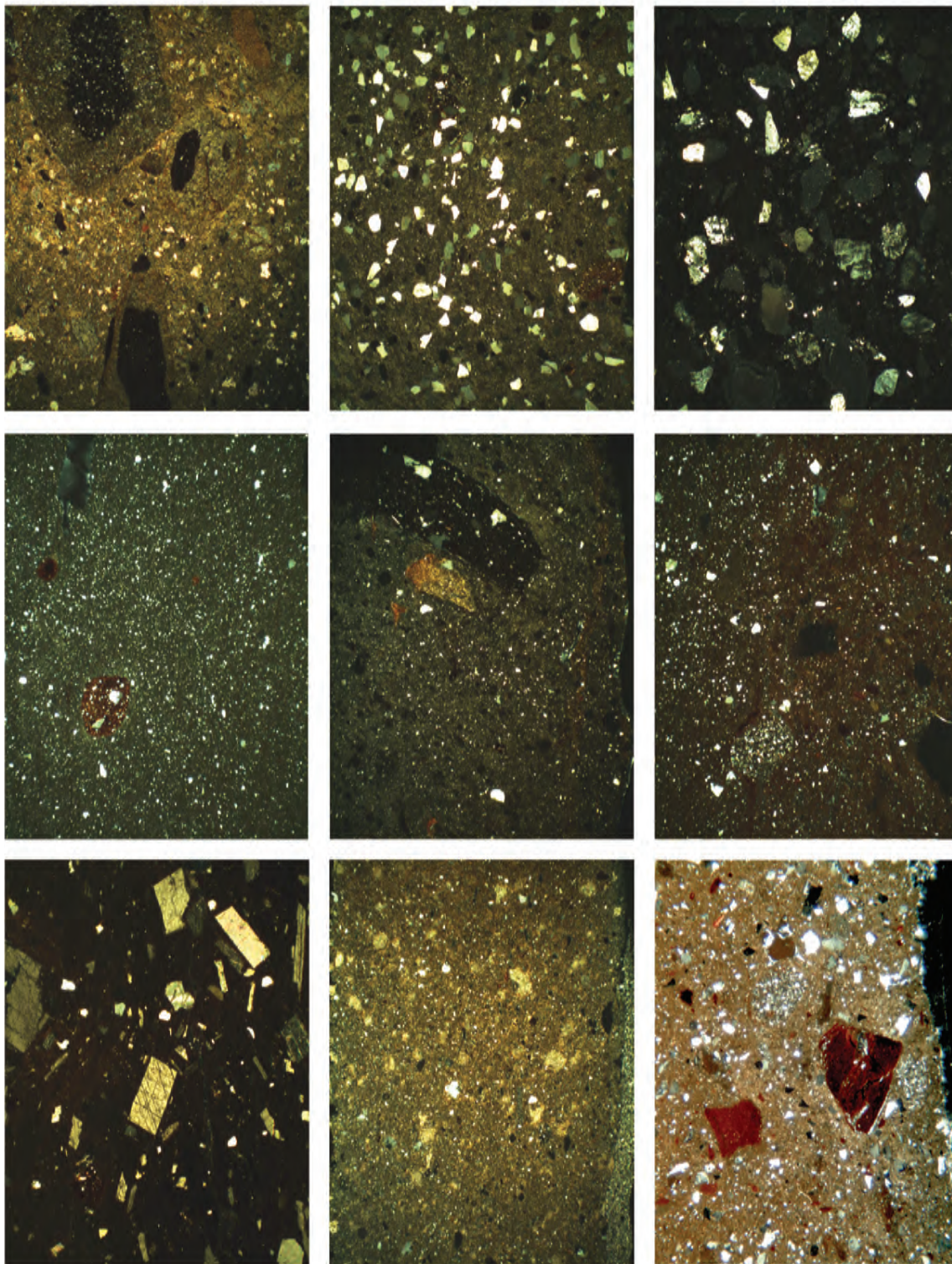


Fig 11. Photomicrographs of petrographic fabric groups detected in the Roman pottery from Vervoz. Top left: Fabric 2, limestone tempered; top centre: Fabric 4, fine, light-coloured matrix; top right: Fabric 5, mudstone in calcareous matrix; centre left: Fabric 6, fine calcareous matrix; middle: Fabric 7, grog in light-coloured matrix; centre right: Fabric 8, quartz in light-coloured matrix; lower left: Fabric 11, grog in reddish matrix; lower centre: Fabric 12, siltstone in reddish matrix; lower right: Fabric B, quartz in opaque matrix. All images taken in plain polar light. Image width = 3.8 mm

patches on their buff surface, suggesting that they had been exposed to different firing atmospheres, whereas others were deep red, suggesting that they had been over-fired.

The vessels of workshop 3 contained Gallo-Belgic pottery, white fine ware and handmade *dolia*, but also white coarse ware (Table 1). The Gallo-Belgic pottery comprised butt-beakers and carinated bowls. They were formed on the fast rotating wheel, and their rim was sharply out-turned. Many examples had a footring, though this was not so with all bowls. The beakers had different types of surface decoration, consisting of decorated bands, variously demarcated by grooves or rouletting. The sharply carinated bowls were thin, brittle and polished ware. They should have been black, but had a wide range of greyish black patches instead. One group of vessels had a rather dull grey colour with occasional red patches. This colour variation on a single vessel evidently resulted from uneven distribution of air during the firing process (Rye 1981, 121–2). The surface colour of the second group was light, indicating that the firing atmosphere was predominantly oxidizing. Several bases were pierced. The white fine ware included flagons and amphorae (Table 1). The flagons had globular and pear-shaped bodies. In some examples the neck sprang sharply or in a smooth curve from the body. The number of mouthpiece rings was variable, but they were always more or less stepped out to follow the splay of the mouth. The handles were boldly bent, and the numerous examples found suggest that the vessels were allowed to cool too quickly at the end of the firing process (Peña 2007, 32–5). The flat-based amphora had a broad, ovoid body, and a thick, short conical neck, which was surmounted by a funnel mouth. The rim was deeply moulded, and had a lower margin stepped out as a projecting ring and was balanced by a bead-lip above (Borgers *et al* 2013, 159, fig 4). The white coarse ware included wheel-thrown urns and jars with inverted and everted rims (Table 1). Sometimes their body was combed, and their surface smoothed. The examples were fired in an oxidising atmosphere, but their defect could not be identified. The number of fragments of *dolia* was quite substantial; the rim was wheel-thrown, and had a black coating. Some variation in the rim was noted, but they fall broadly under one type (Table 1). The base was flat and contained pebbles. Sometimes, traces of the wheel could be identified, suggesting that they were made on a slowly rotating wheel, and left to dry. They were handmade with coils or slabs, pear-shaped, and coarsely tempered with grog. There was generally one or more lines of stabbing or finger-tipping.

5.3 The mid-Roman period

Workshop 4 contained Gallo-Belgic pottery, white fine and coarse ware. The Gallo-Belgic pottery comprised flasks, jars with everted rim and biconical beakers (Table 1). The flasks had a slashed cordon at the base of the neck

and a globular body with extensive rouletted bands. Their surface was characterized by a smooth soft pink colour with occasional smoked patches, and suggested that the desired reducing atmosphere had not been achieved. The white fine ware comprised flagons and two-handled jugs (Table 1). Flagons with thickened bead rims and ring-necked with expanded bead rims were identified among the few diagnostic rim sherds. A substantial amount of *dolium* fragments were found among the pottery wasters. These sherds had a soapy feel, and a soft pink surface colour with a light grey core, which was packed with angular light-coloured inclusions (Table 1).

The wasters which were associated with workshop 5 consisted of white fine ware and Gallo-Belgic pottery. The white fine ware comprised small wheel-thrown jars with flattened rim and ring-necked flagons with simple or expanded bead rim, or with thickened bead rims. The Gallo-Belgic pottery in this assemblage consisted of flasks and biconical beakers (Table 1). The flasks had extensive rouletted bands at the base of the neck and a globular body. Most sherds were fired to a dull grey colour, whereas other fragments were deep black and red and with the intended shape entirely distorted. In particular the latter were diagnostic and produced by explosion during the firing, a damage, which might be indicative of vessels that were either insufficiently dried before being subjected to firing, or heated too rapidly in the initial phase of the firing process (Peña 2007, 33).

Workshop 6 comprised a substantial amount of waster vessels, ranging from Gallo-Belgic pottery forms, fine white ware and amphorae to *mortaria* and *dolia* (Table 1). Each of the pottery wares will be discussed in turn. The Gallo-Belgic pottery consisted of a wide variety of shapes, including flasks, jars, lids, bowls, plates and beakers. There were different types of flasks, some of which were long-necked with cordons below, whilst others had a narrow mouth and a high flattened shoulder and a clear footring. The body was biconical and had multiple cordoning. The bulge between the cordons had a tooled-line decoration. The bowls were rounded or mildly carinated with everted, reeded and drooping rims; the exterior wall grooving was regular, and the profile was more noticeably round than carinated. The plates had a concave wall, one of which was stamped with the die 'CAS' (Willems 1969, 16, pl 2, 17, fig 13; Deru 1994, 117). The globular and ovoid beakers had small bead rims, the decorated zones were bounded by bold grooves and the foot pronounced. Some bases were perforated. This ware was black polished and had a white core, though some sherds were dull grey or deep pink, which suggested that the desired reduction firing had not been achieved. The white ware comprised jars, flagons, amphorae and *mortaria*. The flagons had a narrow conical neck and an out-curved, not-undercut, lip, whilst others had a nearly cylindrical neck (Table 1). Some jars had a slightly out-turned rim with attached

handles, also known as honey jars, whereas others had a simple everted lip. These vessels occurred in different colours, ranging from light to yellowish-beige, pink and grey. There were numerous rims and necks, which were separated from their respective bodies, during or after the firing, whilst other evidence suggested that vessels had exploded in the kiln.

The amphorae had an oblatelly globular body with a thick, short neck, which was surmounted by a cupped mouth and stepped lip. The body was cordoned, and the foot was flat and ringed below (Table 1; Hanut 2001, 25). A hairline crack around the base was seen from the inside. It is very likely that it was caused by thermal shock, whereby the difference in thickness between the base and wall resulted in unequal expansion and contraction (Hamer and Hamer 2012, 88). Other wasters showed a defect known as spalling near the rim, where large parts flaked off parallel to the shape of the vessel.

There were quite a substantial number of *mortaria* in the waster assemblage and they consisted mainly of two types (Table 1). One had a triangular rim and the inner bead of the rim was placed below the surface level of the short thick triangular flange. The spout was small and scarcely projecting. The other type had a very weak beading and a flange either drooping or undercut. One rim had a stamp with the so-called 'herring-bone' pattern, which seems to have been edged by a second die with S-curve (Willems 1969, 11, fig 5, 16, pl 3). Often the rim and large parts of the wall have flaked off parallel to the shape of the vessel. Given that the surface colour and defect was similar to the amphorae, it might be suggested that these types of vessels were fired together.

The *dolia* had wheel-turned and polished rims, frequently with black coating. Their base was flat (Table 1). They often had two added bandings decorated with finger-tipping. The surface of the vessels tended to be light grey, whilst the core was deep grey to black, indicating that the effect of the firing had not entirely penetrated the wall of the vessels (Orton *et al* 1993, 135, fig 11.1). The variation in the surface colour suggested that fire clouding had occurred during the firing process, whilst fire cracks pointed in the direction of too rapid firing. This type of cracking formed a network of fine cracks between the coarse inclusions, sometimes with a hexagonal structure (Rye 1981, 112–4).

5.4 The end of the second century AD

The majority of the vessels from workshop 7 consisted of white fine and coarse ware, with lesser quantities of *mortaria* and grey ware. The usual forms in the fine ware included plates, beakers, jugs and flagons (Table 1). The platters had a roundly curved, concave wall, which met the flat base at something of an angle externally, and without an internal offset. Some had a smoked surface. Flavons had a flanged neck, whilst the jugs had a plain rim and cordon mid-way down the neck, their handle inspired by

metallic prototypes. The globular and ovoid beakers had banded decoration, often rouletted. There were two colours in the fine ware: one was very light-coloured, whereas the other was orange to almost red with a speckled core. The latter may have been the result of over-firing.

There were also smaller quantities of lid-seated jars, lids and bowls (Table 1). The jars either had no neck and everted rim, or a simple everted lip. Some examples had grooving around the neck. The bowls were roughly hemispherical with an everted rim and girth-grooving. Other types of bowls were wide and open with thickened inbent lip. There was a fine and a coarse variant. Some appear to have been over-fired, which has resulted in a hard, deep orange fabric, whereas others were friable and light-coloured with coarse white inclusions (Fig 10). There were different types of *mortaria* (Table 1). Some had a bold beading and a long heavy horizontal flange. The distinctive features of other *mortaria* in this assemblage were the thick moulded lips with a pendant wall below it, the shape of the spout and the absence of grit from the interior. Sometimes the inner lip was incurved, or swollen inwards and offset. The fine grey ware comprised beakers, small hemispherical bowls with slightly out-turned rim and globular body, and roundly curved plates. It was rather unclear whether they actually were waster material, given that they were highly abraded.

6. Selection and Preparation of Ceramic Thin Sections

The author selected a total of 120 diagnostic rim sherds and 6 kiln fragments. All 126 ancient sherds were prepared as standard 30 µm sections and analysed under a polarising light microscope. Ninety thin sections were prepared at the Geo Institute of the Katholieke Universiteit Leuven, whilst the remaining samples were prepared by the author at the Department of Archaeology, University of Sheffield. The ceramic thin sections were grouped in petrographic fabrics based upon the nature of their inclusions, clay matrix and voids (Quinn 2013, 73–9). Compositional and textural criteria were used to detect the presence of specific technological practices, such as raw material processing, the intentional addition of temper, forming and the firing conditions (Whitbread 1986; Cuomo di Caprio and Vaughan 1993).

7. Petrographic Fabric Classification of Pottery Wasters

Petrographic analysis of the Roman pottery wasters from Vervoz revealed a much higher compositional diversity and range of technological approaches than anticipated. A total of 12 distinctive fabrics were identified among the 120 Roman ceramic samples, each of which will be discussed in turn (Table 1).

Fabric 1. Fine quartz in a light-coloured matrix

This fabric is characterized by the presence of frequent, sub-rounded sand-sized mono-crystalline quartz and few rock inclusions in the form of chalcedony, chert and siltstone, contained in a white-firing clay with fine quartz, brown clay pellets, mica and opaque minerals. Voids and inclusions show preferred alignment parallel to the margins of the sherds, suggesting that the vessels have been wheel-thrown. All the samples are high-fired, and characterized by a grey core and light-coloured margins. Some voids result from bloating as the consequence of over-firing. All the vessels in this fabric include fine white ware from workshops 1 and 2 (Table 1).

Fabric 2. Angular limestone

The samples in this fabric are characterized by the presence of sand-sized angular limestone inclusions in a non-calcareous matrix containing quartz, muscovite mica and opaque inclusions. The limestone temper appears to have been prepared by crushing limestone rather than using loose weathered or eroded material. The matrix contains impurities and organic carbon, suggesting that the clay was not cleaned prior to use. The vessels are wheel-thrown urns and *dolia*, which result from workshops 2 and 3 (Fig 11; Table 1).

Fabric 3. Mudstone in grey matrix

This fabric is characterized by the occurrence of a wide range of coarse, sub-angular argillaceous inclusions, set in a non-calcareous matrix with sparse fine quartz and mica inclusions. The argillaceous inclusions include siltstone and grey to dark brown mudstone fragments. The clay matrix of the mudstone inclusions appears to be similar to that of the host vessel, and may therefore represent the source of the base clay used for the fabric. The matrix is further characterized by coarse sub-rounded mono-crystalline quartz, ferruginous inclusions with sand- and silt-size quartz, as well as a few red clay pellets. The multiple opaque minerals, as well as burnt organic material, might suggest that the clay was insufficiently processed. Inclusions are not aligned to the margins of the sections and voids, in the form of mega-vughs and channels, can be associated with relic coil structures. Variability in firing temperature has been observed among the samples in this fabric. The vessels in this fabric comprise *dolia*, which were identified in workshops 2 and 3 (Table 1).

Fabric 4. Fine light-coloured matrix

This homogeneous well-defined fabric is characterized by the occurrence of few single quartz grains, chert and red clay pellets with streaks, set in a white-firing clay with quartz, mica and opaque minerals (Fig 11). The samples in this fabric contain inclusions broadly similar to those found in Fabric 1, with some important textural differences. They contain markedly less coarse quartz inclusions, which appear to be better sorted. Also, the

matrix is optically less active, reflecting a difference in firing temperature. For this fabric, a similar provenance to Fabric 1 might be suggested with the difference that some kind of processing of the raw materials might have occurred. All the vessels in this group comprise Gallo-Belgic forms from workshops 2, 4 and 5, and fine white ware, amphorae, *mortaria*, bowls and jars from workshops 3, 4 and 6 (Table 1).

Fabric 5. Mudstone in calcareous matrix

The samples that constitute Fabric 5 are composed of mudstone tempered calcareous clay containing mono-crystalline quartz, micrite, mica and opaque minerals. The uneven firing of the large mudstone inclusions is suggested by their dark, reduced core and light, oxidized margins (Fig 11). All the samples in this fabric appear to have been wheel-thrown, given that the inclusions and voids tend to show alignment near the margins of the sections. The clay of Fabric 5 is fine, and relatively free from impurities. This evidence might be taken to suggest that the clay was processed so as to become suitable for ceramic manufacture.

Fabric 6. Fine calcareous

The three samples in this fabric are characterized by the presence of fine inclusions of micrite and quartz, set in a calcareous matrix with fine mono-crystalline quartz. Occasionally red clay concentrations and opaque minerals are identified. Inclusions and voids run parallel to the margins of the sherds, suggesting that the vessels have been wheel-thrown (Fig 11). All the samples were fired at a high temperature and in oxidizing atmosphere, and comprise Gallo-Belgic forms from workshop 3 (Table 1).

Fabric 7. Grog in light-coloured matrix

The five samples in this fabric are characterized by the presence of large, angular, often well-sorted argillaceous rock inclusions (ARF), set in a non-calcareous matrix with quartz, mica and rounded opaque inclusions. The ARF are characterized by the presence of coarse angular quartz grains set in a matrix containing fine quartz and mica. Their composition is similar to the host matrix, and they appear to be grog, given their angular nature and voids around the rims (Whitbread 1986; Cuomo di Caprio and Vaughan 1993). All the samples are fired in a well-controlled and high firing temperature (Fig 11). The clay used for this fabric seems similar to that of Fabrics 1 and 4, the difference being that it comprises handmade *dolia*. In addition, the grog temper has no parallels in this ceramic assemblage. The grog inclusions also show an even colour throughout, which suggests firing in a well-controlled firing atmosphere. All the samples include *dolia* from workshops 4 and 6 (Table 1).

Fabric 8. Quartz in light-coloured matrix

This highly distinctive fabric is characterized by the

Table 2. Identifications of wood Taxa from charcoal samples (identified by Koen Deforce)

Sample code:	W123a	W123a	W123b	W123b	W123c	W123c
Sample source:	Kiln 8-9	Kiln 8-9	Kiln 9	Kiln 9	Kiln 3	Kiln 3
Data type:	n	%	n	%	n	%
Species:						
<i>Fagus sylvatica</i> (European Beech)	70	63.6	91	100	134	90.5
<i>Quercus</i> sp. (Oak)	40	36.4		0	14	9.5
Totals:	110	100	91	100	148	100

occurrence of well-sorted sub-angular quartz grains set in a white-firing clay containing fine quartz and mica. Occasional alkaline feldspar, red clay pellets, chert, polycrystalline quartz and ferruginous minerals have been identified (Fig 11). The presence of textural concentration features (TCF) with red clay pellets and streaks may be the result of the blending of two different types of raw materials. All the vessels include fine white and grey ware from workshop 7 (Table 1).

Fabric 9. Fine light-coloured matrix

The two samples in this fabric contain inclusions broadly similar to Fabric 8, with some important textural differences. They contain markedly less coarse quartz inclusions, and their matrix is optically inactive, which reflects a higher firing temperature. In spite of the textural differences, it would appear that the same clay has been used for Fabrics 8 and 9; it might be postulated that Fabric 9 constitutes a finer version of Fabric 8. Indeed, the removal of the coarse inclusions may have been desirable, given that both samples comprise flagons from workshop 7 (Table 1).

Fabric 10. Coarse quartz in light-coloured matrix

Fabric 10 is characterized by the presence of coarse, sub-angular sand-sized quartz inclusions, set in a white firing clay matrix with fine quartz and mica. The quartz inclusions have a bimodal distribution and appear to have been added as temper. There are few sedimentary rock fragments, comprising alkaline feldspar and chert. The vessel is wheel-thrown, and has been fired in a well-controlled firing atmosphere. The fine nature of the clay may be linked to Fabric 9. Both fabrics were found in workshop 7, and represent fine tableware, on the one hand (Fabric 9), and a lid-seated jar, on the other (Fabric 10).

Fabric 11. Grog in reddish matrix

This fabric is characterized by the occurrence of large grog inclusions, set in a fine reddish clay containing quartz, mica and opaque minerals. Orangy red clay pellets and iron concentrations dominate the coarse fraction. Other coarse inclusions comprise rock minerals in the form of chert, siltstone and chalcedony (Fig 11). Fabric 11 is related to Fabric 7 in terms of temper, with

the difference that the clay of Fabric 11 is red-firing. The vessel in this fabric comprises a lid-seated jar from workshop 7 (Table 1).

Fabric 12. Siltstone in reddish matrix

The samples in this fabric are composed of red clay pellets, siltstone and quartz in a non-calcareous matrix. TCF appear in the clay matrix in the form of alternating siliceous and iron-rich clayey streaks (Fig 11), which are broadly similar to Fabric 11. This fabric, however, also shows important textural differences; the inclusions are more sorted, and the matrix is optically less active. Given that the types of vessels in this fabric comprise *mortaria* from workshop 7 (Table 1), it might be suggested that the clay has been better prepared before use.

8. Petrographic Fabric Classification of Kiln Structure Samples

A total of six kiln samples from the workshops were analysed petrographically and were divided in two fabric groups. Five samples bear compositional similarities to Fabric 12, whilst the sixth appears to have a different composition from the fabrics described above.

Fabric A. Reddish matrix

The five samples in this fabric are characterized by the presence of brown clay pellets and sub-angular quartz inclusions, set in a non-calcareous matrix with fine quartz and mica. TCF are in the form of alternating siliceous and clayey streaks. Some samples are reddish brown and they have an optically active matrix, whilst others are deep brown with low optical activity. This suggests that the samples have been exposed to both low and high firing temperatures. In addition some samples contain bloating holes which may result from over-firing. The heterogeneous nature of the matrix links these samples to Fabric 12 of the ceramic assemblage described above, with the difference that no siltstone inclusions have been identified.

Fabric B. Quartz in opaque matrix

The sample in this fabric is characterized by coarse rounded and altered sand-sized quartz, alkaline feldspar

and occasional chert, set in an opaque matrix. The bimodal distribution of the quartz inclusions suggests that they have been added. The internal features of the clay matrix have been lost during firing, and the subsequent formation of bloating holes is evidence for over-firing (Fig 11). The sample was selected from the clay platform of workshop 4 which was near the fire in the stoke-hole of the kiln. It appears to be difficult to compare this sample confidently to other fabric groups described, given that the clay matrix and coarse quartz inclusions have altered.

9. Discussion

Excavations at the Roman pottery production site of Vervoz have unearthed evidence for activities related to the storage and preparation of potting clay, pottery-making tools, and kiln structures. This evidence suggests a great investment in the preparation of the raw materials and hints at the high degree of organisation necessary for manufacturing pottery. In what follows the operational chain of pottery production is reconstructed on the basis of the data gathered in the previous sections.

The procurement of raw materials would have involved the collection of fuel, water, potting clay and temper. Potters made use of a wide range of different deposits. All these raw materials were collected from several locations: the fuel used for firing, comprising beech and oak, was available in the immediate surroundings of the Roman settlement and water may have been collected from yet unidentified wells or the nearby Néblon stream. Usable clay sources included white-firing deposits (identified in Fabrics 1, 4, 8, 9 and 10), red firing alluvial clay (Fabrics 11 and 12) and calcareous deposits (Fabrics 5 and 6), as well as crushed limestone rock (Fabric 2) and loose sandy deposits (Fabric 10). In particular the occurrence of certain distinctive compositions seems to indicate that potters preferred specific raw material sources, and that these were used throughout the manufacturing period at the site (Table 1). Whilst the provenance of these raw materials is beyond the scope of this paper it can be said that local raw materials were used for Roman pottery production (Borgers 2014). These sources are now discussed in turn.

The evidence suggests that the white-firing clay used for Roman pottery production at the rural town of Vervoz could be the clay usually referred to as '*la blanche derle d'Andenne*', which outcrops in the Condroz region (Hanut 2010b; Borgers 2014). This clay source shows some compositional variability and would appear to have been used over a significant period of time. The compositional variability noted between the fabrics can be expected, since the same clay source can vary from one part of the geological bed to another (Hein *et al* 2004).

Reddish alluvial sources outcrop everywhere on and near the Roman site. It is likely that they were used for kiln building. Calcareous sediments can also be found in the nearby valleys. Likewise, the temper – most notably,

limestone rocks and tertiary sands – characterize the regional landscape and were sourced locally (Borgers 2014).

Potting clay, fuel, water and tempering material would have been stored on the premises. Whilst no storage place for wood and water has been identified, the excavators found stored potting clay near the kilns. The paste preparation would have involved the weathering and levigation of potting clay and the mixing of clay and temper. The evidence at the workshops suggests that each of these practices were performed, indicating considerable investment of time and effort and attention to effective infrastructure.

Potters tempered jars, urns and *dolia* with crushed limestone, mudstone and grog. The jars and urns were wheel-thrown: they had inverted and everted rims and vertical combing on the body – a combing that was formed by impressing a toothed implement (Gibson and Woods 1997). They would seem to have evolved from handmade pre-Roman types of vessels (Lepot and Vilvorder forthcoming). On the other hand *dolia* were generally handmade and their rim was wheel-thrown. Whilst potters initially tempered this type of vessel with mudstone (Fabric 3 and Fabric 5), at a later time they used grog instead (Fabric 7). Adding limestone or mudstone would have improved the workability of the paste. Alternatively, it would have aided the drying process of such large vessels, and given them strength after firing. Furthermore, mudstone and grog have the same thermal expansion as clay (Rye 1981, 33), which makes them an ideal tempering material. However, it would appear that cultural factors also played a role in a potter's decision to add temper. For one thing, the practice of limestone tempering would seem to have been confined to the Condroz region (Hanut 2010a), and might be taken to reflect the specific regional landscape. For another, grog temper was generally employed for the manufacture of prehistoric vessels in the region of the Meuse River system (De Mulder *et al* 2008). Moreover, potters added grog to different types of clay sources. This suggests that their technological practices cannot be explained by material constraints of the raw materials alone.

Potters continuously selected white-firing clay deposits (Fabrics 1, 4, 8, 9 and 10) for the manufacture of a wide variety of Roman vessels. However, these deposits also started being used for the production of *dolia* in workshops 4 and 6 (Fabric 7). Hence, it might be postulated that Fabric 7 was the result of interaction between potting groups, sharing similar raw materials and working in different traditions. There is also the presence of tempered (Fabric 11) and non-tempered varieties (Fabric 12) of what otherwise appears to be an identical clay paste. This suggests that potters might have consciously chosen to add or leave out temper from their clay. The fact that the tempered variants comprise lid-seated jars invites the suggestion that the reason for tempering was to improve

the performance of the fired vessel. However, this type of vessel was made according to different recipes (Fabric 10 and Fabric 11), which also suggests that the technological practices used may not be explained by the technical or physical constraints of the clay deposits alone. In light of the foregoing considerations it would appear that the continuity of cultural practices played a role in the potters' technological choices at the site of Vervoz.

The almost identical shape, size and finish of a wide range of fine ware vessels attest a well-coordinated and balanced way of throwing on the potter's wheel. The facilities produced evidence for a socket stone. This may have been part of a potter's kick wheel, in which the wheel axle would have turned. Other parts of the device may have been of wood.

Potters would have set out newly formed vessels to dry for a few days, or up to several weeks in the case of thick-walled vessels, such as *mortaria*, *dolia* and amphorae. Ideally, this would have taken place in a space where they would not have obstructed other operations. There may have been need for a covered area for vessels that needed to dry slowly.

Potters finished the fine ware during the secondary forming stage. They, for instance, trimmed the bases and smoothed the surfaces. Iron scrapers could have been used to trim excess clay from the rotating vessel, whilst the stone polishing tool was probably used for the creation of the matt surface on the Gallo-Belgic pottery.

The evidence for vertical updraught kilns with a permanently raised oven floor was overwhelming at the site. Compositional analysis of the kiln fragments suggests that the structures were built with Quaternary alluvial clay sources, and the platforms were tempered with quartz sand. The use of quartz as temper is known to increase the mechanical properties of clay (Kilikoglou *et al* 1998; Vekinis and Kilikoglou 1998). Indeed, potters might have decided to temper the oven plates in order to make them thermally shock resistant.

Whilst the site produced no evidence for rim-to-rim and base-to-base stacking in the kiln, a published picture suggests that the vessels were stacked upside down (Willems *et al* 1966, 58). Furthermore, using colour as a criterion it would seem that flagons were fired in the same batch with other fine wares, whereas *mortaria* and amphorae were fired separately. This is in keeping with the suggestion that such thick-walled vessels had to be heated more slowly than thin-walled pottery (Rye 1981, 105). The firing of *mortaria* and amphorae would have required a sizeable kiln. One such example has been identified in workshop 6.

The charcoal found among the waster material consisted mainly of *Fagus sylvatica* (beech), and a smaller percentage of *Quercus* (oak) (Table 2, identifications by Koen Deforce). Oak wood makes for a long-lasting high-energy fuel. However, the fragments were very small and gave no indication as to the dimensions of the wood

used. Beech wood yields long flames when used as fuel (Dufay *et al* 1997, 60–1).

Evidence suggests that potters removed and dumped their waster vessels in pits and abandoned kilns. In addition, they seem to have deliberately destroyed waster vessels by piercing their bases. A similar practice has been identified at the potteries at La Graufesenque. Dannell (2002, 218) interprets it as a deliberate action of potters to render the rejects unsaleable, since it destroyed the stamp at the bases of the vessels. Whilst this might be true for the stamped *sigillata* wares, it is worth noting that potters in the regional production sites, such as Vervoz, only rarely seem to have stamped their pottery. Elsewhere, numerous pierced and intentionally broken and burnt pottery has been interpreted as people's offerings to the gods (Willems and Neaud 2012; Martens 2007; Fulford and Timby 2001). That potters at Vervoz also subscribed to such practices is suggested by the pierced bases of waster vessels at the site.

10. Organisation of the Pottery Industry

The local ceramic industry at Vervoz can be considered a rural nucleated industry (Peacock 1982, 38–43). The placement of the workshops outside the core of the town, suggests a degree of regulation and planning. It is not without significance that pottery production occurred in a commercially viable area by a small town on an arterial road, a situation suggestive of the level of investment placed in the enterprise by the owners and craftsmen and their anticipation of means of marketing and distribution of their products. The specific location was evidently undeveloped land, alongside the settlement on its outskirts, and so the manufacturing activities presumably did not seriously detract from the monumental character of the area nor pose an environmental hazard to property or people in such a position (Fig. 2).

From their origins in the pre-Flavian period these workshops seem to have specialised in the production of Gallo-Belgic forms, flagons, honey jars, *dolia* and amphorae. This shape repertoire with Roman style ceramics, and Romanised versions of Gallic pottery, is relatively standard and was present in elite tombs (Brulet 1992; Neuru 1987). Other pottery industries producing similar pottery wares were located at the rural town of Braives situated in the Condroz region 32km north-west of Vervoz (Brulet 1983; see Fig 1), at the Lungengasse street in Cologne (Carroll 2004), at Bergheim-Fliehsteden (Aeissen and Höpken 2009) and at Mourmelon-le-Petit in the Champagne region (Deru 1996, 168). The potters at the site of Vervoz were the next generation working in these potting traditions, and it is therefore possible that they were native potters, imitating Gallo-Belgic pottery from the Champagne region. Indeed, it is likely that ATISSO imitated ATTISSUS, who worked at Mourmelon-le-Petit (Deru 2004, fig 74, 1–3).

Copying technical knowledge is seen widely in pottery manufacturing in the Roman era (Willis 1994; 1997; 1998, 247–8; Biddulph 2013). Hence, it is reasonable to assume that the potters at the regional production sites borrowed technical information from elsewhere. Stamped *dolia* are another case in point. At the sites of Vervoz and Bergheim-Fliehsteden, potters stamped *dolia* with a cross-edged stamp in a circle around the mid-first century AD. No examples of dies were found so it must be assumed that they were made of wood or clay. Both workshops operated at the same time and it would therefore appear that potters at these two production sites had been interacting. As Willis (1994, 146) points out, a traditional argument for copying has it that it was a response to local demand, since the number of imports available was inadequate to satisfy consumer needs. However, an alternative explanation could be suggested, to the effect that this import was copied because of a felt necessity to ‘reinterpret’ the alien shape. By integrating the new shape in the existing repertoire, produced by local manufacturing traditions, the import might have been rendered acceptable to the local populations (Willis 1994). Alternatively, perhaps potters, who had been employed previously in one of the workshops at Braives, Mourmelon-le-Petit or Cologne, emigrated to Vervoz. Certainly, the Condroz region would have been attractive to craftsmen trying to take advantage of the numerous developing markets in the hinterland of the Rhine *limes*. If this was the case, the question arises how the industry would have been organised.

It has been observed that a small number of craftsmen were involved in pottery manufacture at the site of Braives producing a constricted range of pottery in one kiln at a time (Brulet 1983, 210; Jacob and Leredde 1982). Hence, it might be suggested that it was a single business – that is of a single master potter or owner, who was moving around the site over time. By contrast a number of workshops at Vervoz were contemporary and had continuous output (as suggested by the reuse of kilns for a series of firings). These workshops (*officinae*) may have been grouped together in pottery yards (*figlinae*). The clustered kilns suggest this kind of arrangement and the presence of a community involved in potting activities with many potters working together, sharing raw materials, making vessels in different traditions and firing them simultaneously. The relative longevity of pottery production at the site of Vervoz further indicates that it was a specialist centre, in which potters shared technological knowledge either through collaboration or ‘borrowing’ technical information, and transmitted their technological traditions through time.

If two workshops located in different *civitates* had indeed been collaborating, then they could have been sub-branches of one single business enterprise. In this scenario, the master potter would have emigrated with

the necessary equipment and craftsmen to set up a new workshop to conquer new markets (cf. Hartley 2012). In doing so, the master potter would not have been constrained by the taxes imposed on the *civitas* borders (Greene 1986, 161; Fulle 1997, 143). Alternatively, the purpose of stamping *dolia* might have been to guarantee compliance with certain standards or expectations of quality or measure. Especially for amphorae, it has been argued that marks should be seen as a guarantee of intactness, stability, and correct measure for commercial and customs purposes. Legal sources show that these qualities could be expected not only of amphorae, but also of *dolia* (Fulle 1997, 115).

The firing of *dolia* would have required a sizeable kiln to accommodate them. The type of kiln identified at Vervoz is consistent with *dolia* production. However, the modest size of these kilns would not have been well-suited for firing this type of vessel. The internal diameter of the kilns measured c. 1.60 m. By contrast kilns for this purpose are known to have measured 2.6–3.0 m externally and 2.3–2.6 m internally, as at the Lungenasse site in Cologne (Carroll 2004). Similarly, two kilns at Bergheim-Fliehsteden measured 2.9 m and 1.9 m respectively (Aeissen and Höpken 2009). Hence, it would seem that the kilns used for *dolia* production at the site of Vervoz might not have been amongst those excavated and so may yet be discovered. Indeed, there is some evidence for postulating the existence of undiscovered workshops (see Borgers *et al* 2013).

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Unusual kiln vessels from Danbury, near Chelmsford, Essex

Joyce Compton

1. Introduction

During monitoring work for Aggregate Industries (UK) Ltd at Danbury Quarry in 2006 a Roman pottery kiln (NGR TL 762 058) was uncovered by Phoenix Consulting Archaeology Ltd. Upwards of 14kg of pottery, and a similar quantity of ceramic building material, was initially recorded. The pottery was further recorded, by context, by the Essex County Council Field Archaeology Unit, noting the relevant sherd counts and weights by fabric. This paper provides an appraisal of a number of unusual vessels deemed to be kiln products, since full publication of the site is unlikely to take place. There was no requirement for the work to be published and there was no funding provision for this outcome. The client report is lodged with the Essex Heritage Record (EHER 47628; Bain and Richmond 2007).

Using the Essex County Council Field Archaeology Unit fabric series five main fabric types were identified in the full assemblage. Vessel forms were categorised using the type series devised for Chelmsford (Going 1987, 13–54). The pottery was fairly fragmentary (average sherd weight 17.5g) although several large pieces were present, especially in the main kiln fill which contained more than three quarters, by weight, of the total. Burnt and blistered sherds were common and some of the pottery, mainly the non-kiln sherds, was abraded. The assemblage was divided into two main groups: probable kiln products and non-kiln pottery, of which the latter formed the smaller component.

2. The Non-Kiln Pottery

The non-kiln component formed approximately 15% of the total by weight and comprised mainly coarse wares: Rettendon type ware, sandy grey and black surfaced

wares. A small amount of Hadham oxidised ware, including part of a mortarium, was also recorded. In general, the fabric types have late Roman characteristics. Few forms were identifiable among the non-kiln pottery. There are sherds from a sandy grey ware bowl with cable decoration along the rim and at least two sandy grey ware bifid rimmed jars. Many joining sherds from a single sandy grey ware G35.2 jar (Going 1987, fig 11) were also recorded. The jar has a row of diagonal stabbing on a narrow neck cordon and groups of faint burnished lines around the girth are visible. This vessel type has a first half of fourth century date (Going 1987, 26). There are no firing faults, but its good condition might indicate a kiln product.

3. Kiln Products

Almost all of the identified kiln products occurred in sandy grey ware; wheel-thrown, hard-fired and dark grey with red margins, although there is much variation due to firing differences. Inclusions of rounded white quartz, up to 2mm in diameter, and occasional large flints, are also visible macroscopically. Vessel forms include a single sandy grey ware G24 jar (Going 1987, fig 10) and several bowl-jars in a finer fabric. The majority of the sandy grey ware sherds, however, derive from a number of unusual cylindrical vessels whose form is not readily classifiable. The form falls between what could be classified as either a jar or a beaker, although it does not fit exactly the criteria for either form classification (vessels whose girth is greater than the rim diameter). The vessels have a clumsy appearance, certainly not designed as tableware or for drinking. For convenience, therefore, they have been classified as Going's Type S (Miscellaneous; 1987, 36). They are somewhat distorted,

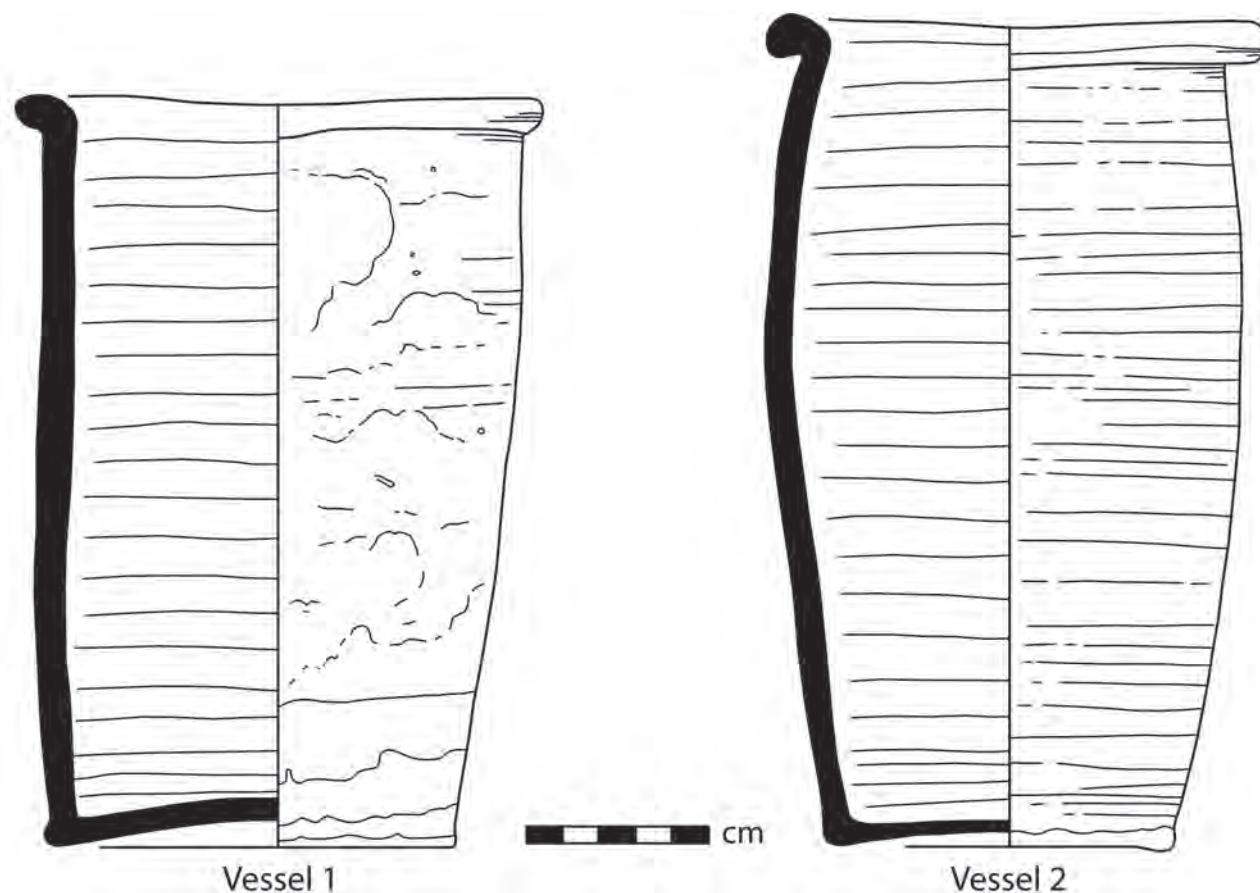


Fig. 1. The Danbury vessels

perhaps as a result of warping during firing, and there are many blisters and spalls. Most have out-turned bead rims, but for at least two the rim is squared-off. Sherds from at least six vessels were recorded, and two have been reconstructed as far as warping and spalling have allowed (Figs 1–3).

The vessels, as reconstructed, have rim diameters of *c.* 140mm, heights of 210 and 230mm and rim eves of 0.55 and 0.72. They are crudely made, even allowing for the defects resulting from firing mishaps. There is pronounced finger rilling on the interiors and the whole appearance is one of robustness, although bases are relatively thin compared to the walls. Vessel function has not been conclusively established, although a parallel of sorts can be found in a discussion on Iron Age and Roman salt trade patterns (van den Broeke 1995, fig 6 no 15). Although use as salt containers is not proposed for the Danbury vessels, their robustness may indicate an ‘industrial’ function of a similar nature.

Dating evidence is provided by the Rettendon type ware in the main kiln fill, a flinty, typically late Roman fabric, named after its type site at Rettendon, Essex (Tildesley 1971). Kilns making this type of ware were also identified at Inworth, near Kelvedon, and Moulsham

Street, Chelmsford (Going 1987, 89). Going provided a late third to mid-fourth century AD production date for the fabric type. In addition, the G35.2 jar in the main kiln fill, which may be a kiln product, is dated early to mid-fourth century (Going 1987, 26). The kiln is therefore likely to have been in use during the first half of the fourth century AD.

Two reconstructed vessels were made available for comment at the Cardiff meeting of the SGRP in 2007.

4. Discussion

As noted above, the vessels’ robust appearance has suggested an ‘industrial’ function, for instance as parting vessels. Parting (separation of gold and silver from smelted ore using salt) is known to have taken place in Roman Britain (Bayley 1991), although finds of parting vessel fragments have so far only occurred on urban sites and these appear to be smaller than the Danbury pots. A suggestion has been made that the Danbury pots are saggars, used in the firing of fragile vessels within the kiln. Roman saggars are very rare, indeed in his report on the Colchester kilns Rex Hull (1963, 28) noted that ‘there is no evidence that saggars were ever used in



Fig 2. Vessel 1, the smaller cylindrical vessel (scale 100mm)



Fig 3. Vessel 2, the taller cylindrical vessel (scale 100mm)

Roman kilns'. Swan (1984, 40) confirms this, noting that saggars are known only at Holt (Grimes 1930, 182), where they were used for the manufacture of lead glazed ware. In this case, the saggars appeared to be waster Type 212 bowls used as pairs 'rim to rim' (see frontispiece in Grimes 1930 for reconstruction drawing).

Gwladys Monteil has kindly drawn my attention to similar straight sided vessels recently excavated from a ditch at the Camp Ground, Earith, Cambridgeshire. These are also bead rimmed but in a finer buff fabric; one pot has evidence of sooting externally, thus possibly pointing to 'industrial' use. The assemblage accompanying these vessels has been dated to the fourth century AD (Katie Anderson pers. comm.). A second parallel, in good buff coloured ware, comes from a building at Asthall in Oxfordshire (Taylor 1939, fig 35). Context details are lacking but a late Roman date is suggested (Taylor 1939, 320).

Finally, the similarity between the Danbury pots and a single 'refractory vessel' found at John Dwight's Fulham Pottery (Green 1999, fig 237.567) cannot be ignored, although this is dated to *c* 1673. The vessel is straight-sided, thick-walled and crudely made, with a rim diameter of 140mm and height of *c* 228mm. Inevitably use as a sagger is proposed, or for use in the preparation of frits.

Although separated by thirteen centuries it is interesting to note that the Fulham vessel is near identical to the Danbury pots. Unfortunately, the similarities are just as likely to be a 'red herring'.

Acknowledgements

Thanks are due to Andy Richmond of Phoenix Consulting Archaeology Ltd for providing the opportunity to examine the pottery and permitting the interim findings to be presented to the Study Group for Roman Pottery. Mark Atkinson of the Essex County Council Field Archaeology Unit proffered many useful comments during study of the pottery and edited the assessment report upon which this paper is based. Thanks also to the many SGRP members who put forward numerous suggestions for vessel function and, in some instances, provided parallels, and to Alison Bennett, Historic Environment Advisor at Essex County Council, for providing information with regard to the client report. Ed Biddulph kindly read through the paper and his comments are much appreciated. The drawings were undertaken by Iain Bell of the Essex County Council Historic Environment team and the reconstructed vessels were photographed by Frances van Keulen.

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Getting samian ware to Britain: routes and transport possibilities

Geoffrey Dannell and Allard Mees

1. Introduction

Much of what is written here reflects what we said at the recent Reading conference ‘Seeing Red’ and which was published in the conference proceedings volume (Dannell and Mees 2013). It is the briefest of surveys, consistent with its original form which was fitted to the time limits of the conference at which we presented this summary, namely the Study Group’s Amsterdam conference organized by Julie van Kerckhove and Mark Driessen. The data used comes from *Names on Terra Sigillata* volumes 1–6 (Hartley and Dickinson 2008–2010). It is as well to recall the following: that Hartley and Dickinson’s data was collected over a period of some 40 years from material presented to them for identification and reporting, from publications, and material collected from visits to institutions both in Britain and abroad. There is certainly a proportional over-representation in the British material; much more was examined, and the quantum of excavation rather greater than in some other countries. For financial and political reasons (the majority of the collecting was done in the ‘Cold War’ period), certain areas were limited to their published ceramics, so that the records for Iberia, Italy and eastern Europe are comparatively deficient. Once again we have to emphasise that this data refers only to signed and stamped vessels, and cannot be taken as entirely representative of samian vessel populations. Many decorated vessels were not signed or stamped, and this bears particularly on conclusions about products from the later second-century kilns which manufactured very considerable quantities of unmarked plain vessels. The minor production centres, whose decorated ware made up a significant proportion of their exports, are particularly affected by these traits. It should also be remembered that we have no evidence for samian being shipped by sea on its own. What is known

clearly shows it as a super-cargo, alongside more bulky goods like those contained in amphorae, and perishable commodities in sacks (*cf* Nieto Prieto *et al* 1989, 59).

2. The British Market and General Routes

Britain received by far the majority of its samian from continental Europe. The two domestic production sites of Pulborough (Simpson 1952; Webster 1975) and Colchester (Hull 1963) made only marginal contributions to satisfying demand. It hardly needs saying that all continental samian had to get to Britain by sea, often having made extensive journeys along the great river systems of Gaul and Germany. The vessels involved in this traffic would have included sea-going ships, which clearly arrived in Britain directly (*cf* Bird 1986; Dickinson 1986), or which had ascended the Rhône system, probably as far as Chalon-sur-Saône (*cf* Bonnamour 1975). There, a consequent transshipment to barges would have been required, similar to the one that went down in the river Allier with its samian on board (*cf* Rhodes 1989, 46), to get to the valley of the Moselle, and thence to the Rhine, and these barges must have been the vessel of choice for much of the distance. These two types of water-borne carriers imply a reloading operation somewhere nearer to the French or Dutch coasts, and identification of these entrepôts is a vital link in the story (Fig 1).

Why Britain should have been such an attractive market for samian exporters is a subject in itself, but two observations can be made. First, in the late Iron-Age, limited amounts of this class of ceramics were reaching Britain (see below). Its appearance on high status sites may have established it as a commodity worthy of social emulation by a growing ‘middle class’ indigenous population with a trickle-down effect, so that by the later

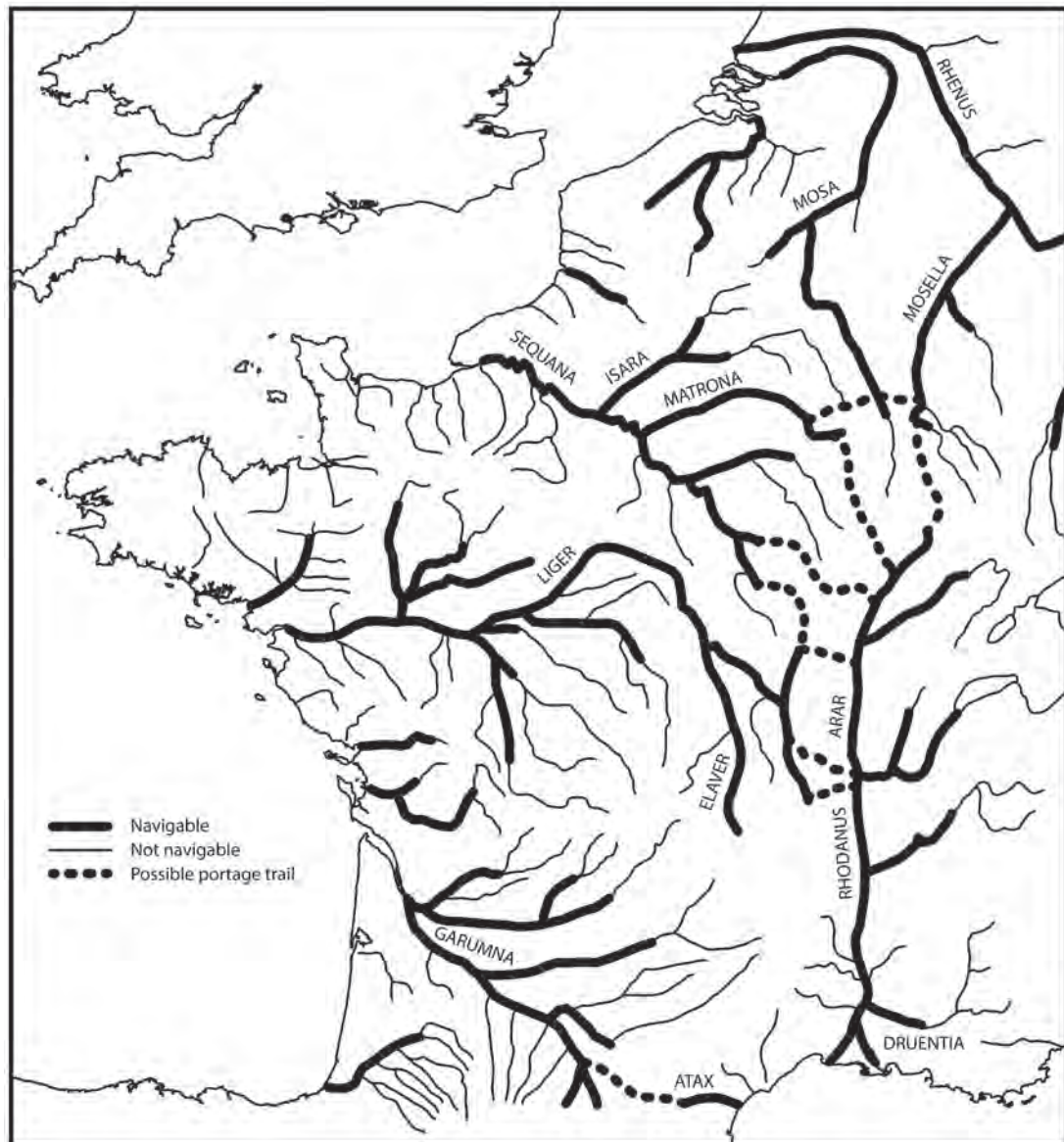


Fig 1. Rivers and transport routes in Gaul

part of the first-century samian is also found widely in rural communities, confirming the interest in the ware in such contexts. The driver which enabled this distribution was certainly the presence of a large standing army in the province of *Britannia*. The army had long been a large-scale end-market for Italian and Gaulish samian and while there is no evidence as yet that it contracted directly for supplies the storehouses of military camps were clearly well-stocked with quantities of samian (e.g. the finds from Cirencester fort (Hartley and Dickinson 1982) and Inchtuthil (Hartley 1985)). Middlemen supplying the army had pipelines to provide both staples and subsidiary products which would have also served to make them available to the civilian market.

Wares in the Italian tradition arrived well before the Claudian invasion and their distribution is shown in

Figure 2. The origins of this pottery are mixed, with kiln sources like Arezzo, Pisa, and Lyons, together with the very first exports from La Graufesenque. We can see that for the most part the consuming sites were represented by the cantonal capitals of the south and south-east, just the areas which the early authors characterise as being civilised in Roman terms (Caesar *The Gallic War*, V.14; Strabo *Geography*, 4.5.3). In order of magnitude we have Sheepen, Silchester, Verulamium and the Chichester area. However, it is worth noting the outliers of Leicester, and perhaps more surprisingly Redcliff-North Ferriby on the Humber (*cf* Corder and Davies Pryce 1938). This pottery is accompanied by other high-status material like amphorae, fine wares, jewellery and silverware all suggesting either trade links, or gift-exchanges with the Roman world in the pre-Claudian invasion period. The



Fig 2. The incidence of stamped sigillata wares in the Italian tradition at British sites

relative *sparseness* of the finds compared with continental sites at this period makes it difficult to be certain how each ceramic vessel reached its point of discard, but

Strabo tells us of four routes to Britain (*Geography* 4.5.2, out of the mouths of the rivers Rhine, Seine, Loire and Garonne). At this time the Rhine route hugged the

coast, to somewhere in the Calais/Boulogne area, from which the perceived perilous crossing could be made; (it should be remembered that both Caesar and Claudius in the course of their invasions found the Channel crossing to be a major hazard, as later it proved an obstacle to both Napoleon and Hitler; minimising the time spent on the open sea by shortening the route would have been attractive, until perhaps familiarity opened up greater opportunities). This would accord well for the sites on the east side of Britain, but the routes which branch off the Rhône and involve land transport onto the rivers Loire and the Seine may have been used for Chichester, Silchester and the Bagendon complex at various periods (*cf* Saillant and Sanchez 2008).

3. Relations with Major Kiln Sites

With the development of La Graufesenque we can see that the Rhône-Moselle-Rhine corridor is the major artery of delivery (Fig 3). While British consumption remained below the norm in the mid-first century, the distribution over the province is fairly widespread south of the Fosse Way. The evidence from Colchester (*cf* Hull 1958, 152–4 and 198–202) and London (*cf* Dunning 1945; Dannell 2003) would support the view that the Thames estuary was the major entry point. This is reinforced later in the first century (Fig 4) as the British distribution moves above the norm. There do not seem to be any continental coastal sites to suggest a change in the overall routing, although the developments on the upper Seine might indicate that its river route was coming back into favour, and possibly may have been used to supply some southern British consumers.

The case of Montans is entirely different: in the first period, up until around *c* AD 50, the heavy clustering along the Tarn/Garonne system; in the west of Gaul; and its comparative absence on the northern Rhineland sites, must lead us to the conclusion that direct sea passage out of the Tarn/Garonne system was the routing which was selected for the few British finds. Such a voyage meant rounding the Brittany peninsula (Fig 5). For the later period the majority of the ware found its way to sites in southern Britain, and the concentrations both at Richborough and London indicate ships making landfall on the Thames, with inland distribution from there (Fig 6). For the rest of the province there are two possibilities. The finds from Exeter, Wilderspool and Wroxeter suggest that direct deliveries could have been made to western seaports, perhaps up the Severn estuary and that of the Dee (see Wild this volume). There are also considerable quantities from Scotland. Direct deliveries up the west coast continuing the putative route north of the Dee are an obvious possibility, but the Montans stamps from Inveresk are intriguing; Paul Tyers (*pers. comm.*) points out that there is BB2 as well as Upchurch ware and mortaria from Lower Germany present on the site,

so this may represent redistribution out of the Thames estuary. Given the second century evidence for a trade link between Bordeaux and York (*cf* CIL, xiii, 634) deliveries up the east coast should not be excluded.

The case of Les Martres-de-Veyre is both complicated and interesting (Fig 7). The production appears to plug a gap between the reduction in long distance trade out of La Graufesenque and the commencement of exports of standard quality products from Lezoux. Britain, as can be seen, was the point-of-sale for a very large proportion of the Les Martres-de-Veyre production. However, there are two other sub-groupings representing the two Germanies. How exactly these are routed is not clear. The old passage onto the Rhine via Augst and Cannstatt seems a possibility; Hanau-Salisberg and Mainz would then be a fulcrum, with two arms, one swinging west through Bavay, the other continuing down the Rhine. It is striking that in examining the samian from Trion, there is no clear evidence of products from Les Martres-de-Veyre, whereas there is an abundance of material from the corresponding period of Lezoux. This adds to the impression that the former kiln site's ware was not routed eastwards (Brenda Dickinson *pers. comm.*). The numbers represented in the distribution may conceal a rather more important fact. London has 137 stamps, nearly as many as are known from the kiln-site itself, while Nijmegen has 27 and Vechten 24 (Table 1). Most of the other representations in Britain are larger than the corresponding continental group. This disposition opens the possibility that there was back-loading of cargoes out of London to the sites on the lower Rhine. It must be remembered that transport traffic is a two-way business. A 'least-cost' route analysis of the transport costs of samian from Les Martres-de-Veyre to Vechten on the Lower Rhine, in The Netherlands, demonstrates that the goods must have passed Britain – not travelled along the Rhine – before being embarked on the Lower Rhine (Fig 8; *cf* Mees 2011, 260). The distribution pattern of Les Martres-de-Veyre therefore seems to have been transport-cost driven. As a proof by contraposition, it can be demonstrated that along the Rhine, only the route from Les Martres-de-Veyre to Augst in Switzerland would have been cheaper than all-the-way-round via Britain. This might explain why the products of Les Martres-de-Veyre never had a serious market share in the Rhine area.

While many boats will have been bringing continental merchandise to Britain (Hassall 1978), we know of movements in the other direction evidenced by recent finds from Oudenburg and Forum Hadriani (Vanhoutte *et al* 2009; Driessen and Besselsen 2014, 160–4, 209–11). Given the very large representation of Les Martres-de-Veyre products at London trans-shipment is a likely solution, or that sea-going vessels engaged in cabotage delivered cargoes to both areas, passing through London first (*cf* Nieto Prieto *et al* 1989, 239–44, for a good model of the possibilities in the Mediterranean).

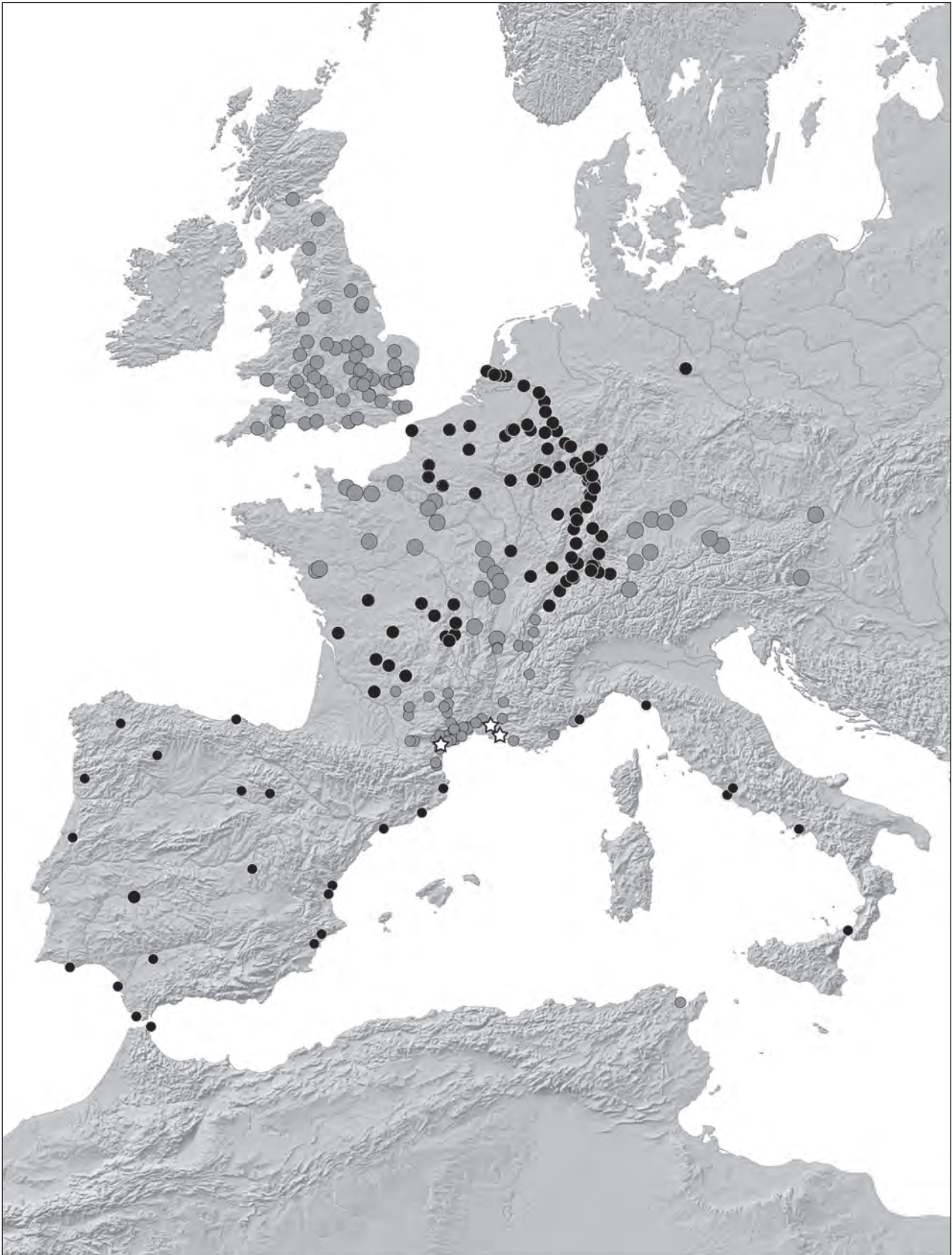


Fig 3. The incidence of stamped decorated samian produced at La Graufesenque of the mid-first century AD with values calculated using the Mócsy coefficient. Grey dots denote sites with below norm values; black dots denote sites with above norm values. White stars denote port sites

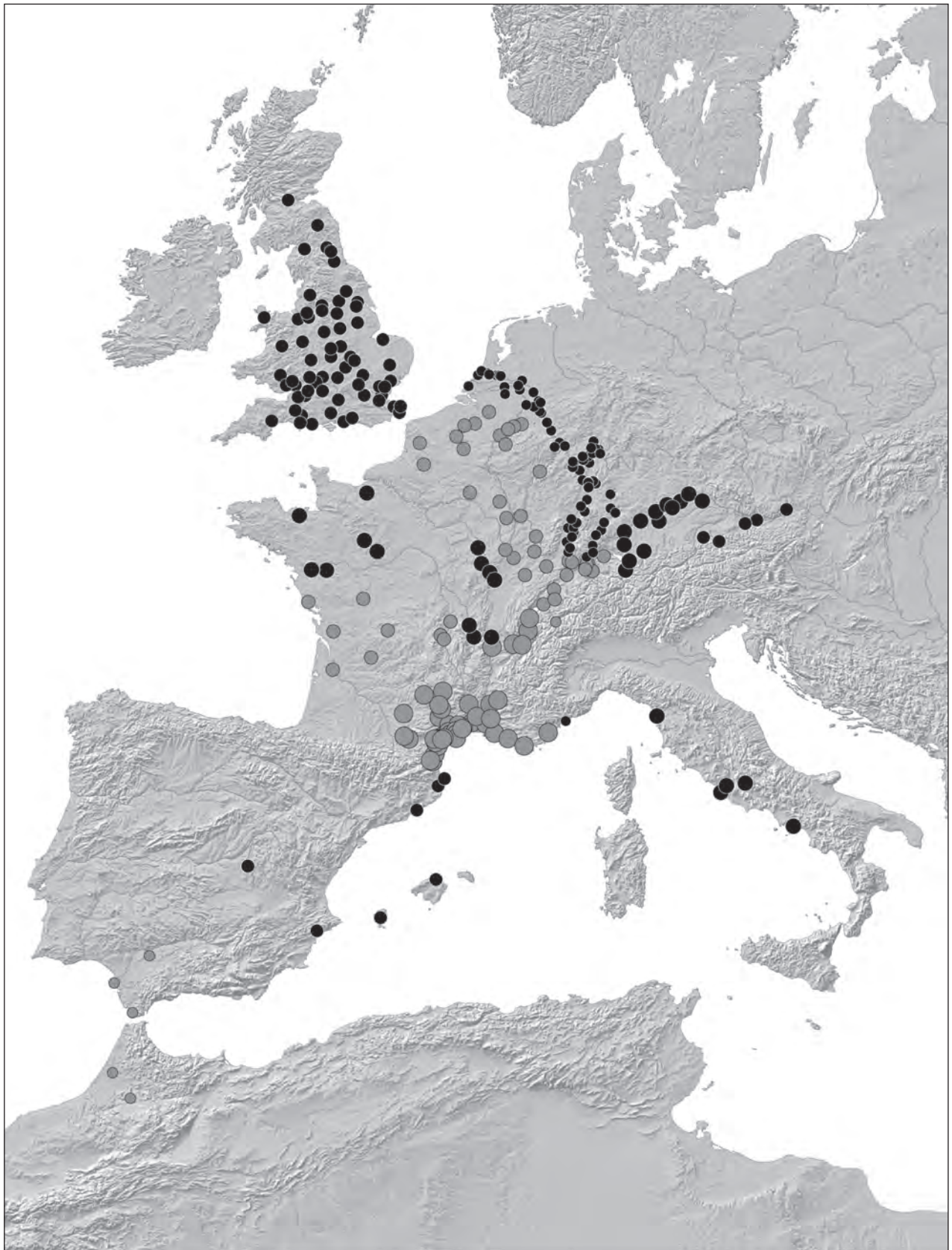


Fig 4. The incidence of stamped decorated samian produced at La Graufesenque in the later first century AD with values calculated using the Mócsy coefficient. Grey dots denote sites with below norm values; black dots denote sites with above norm values

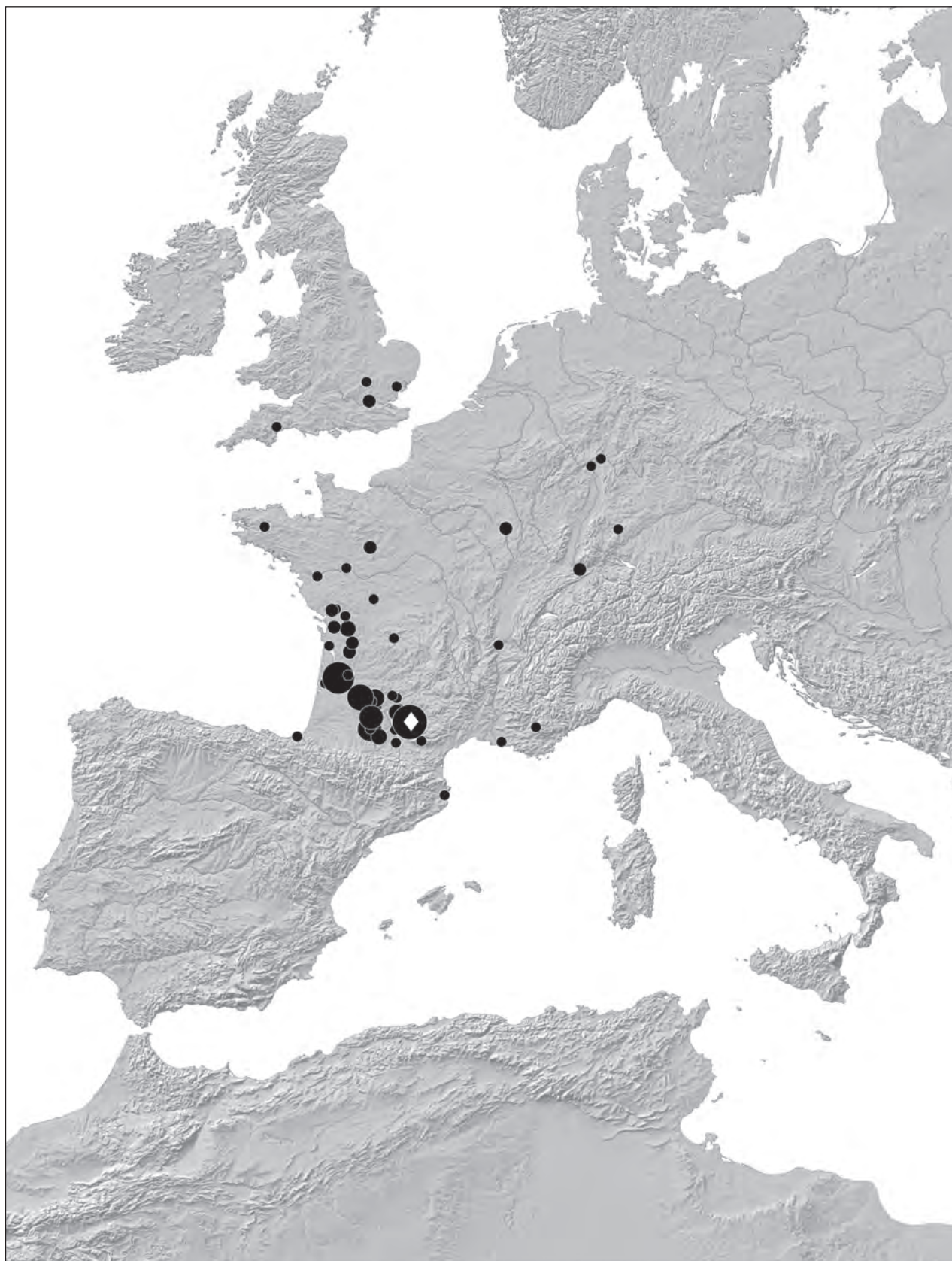


Fig 5. The incidence of stamped samian produced at Montans up to the mid-first century AD. The diamond denotes the production centre

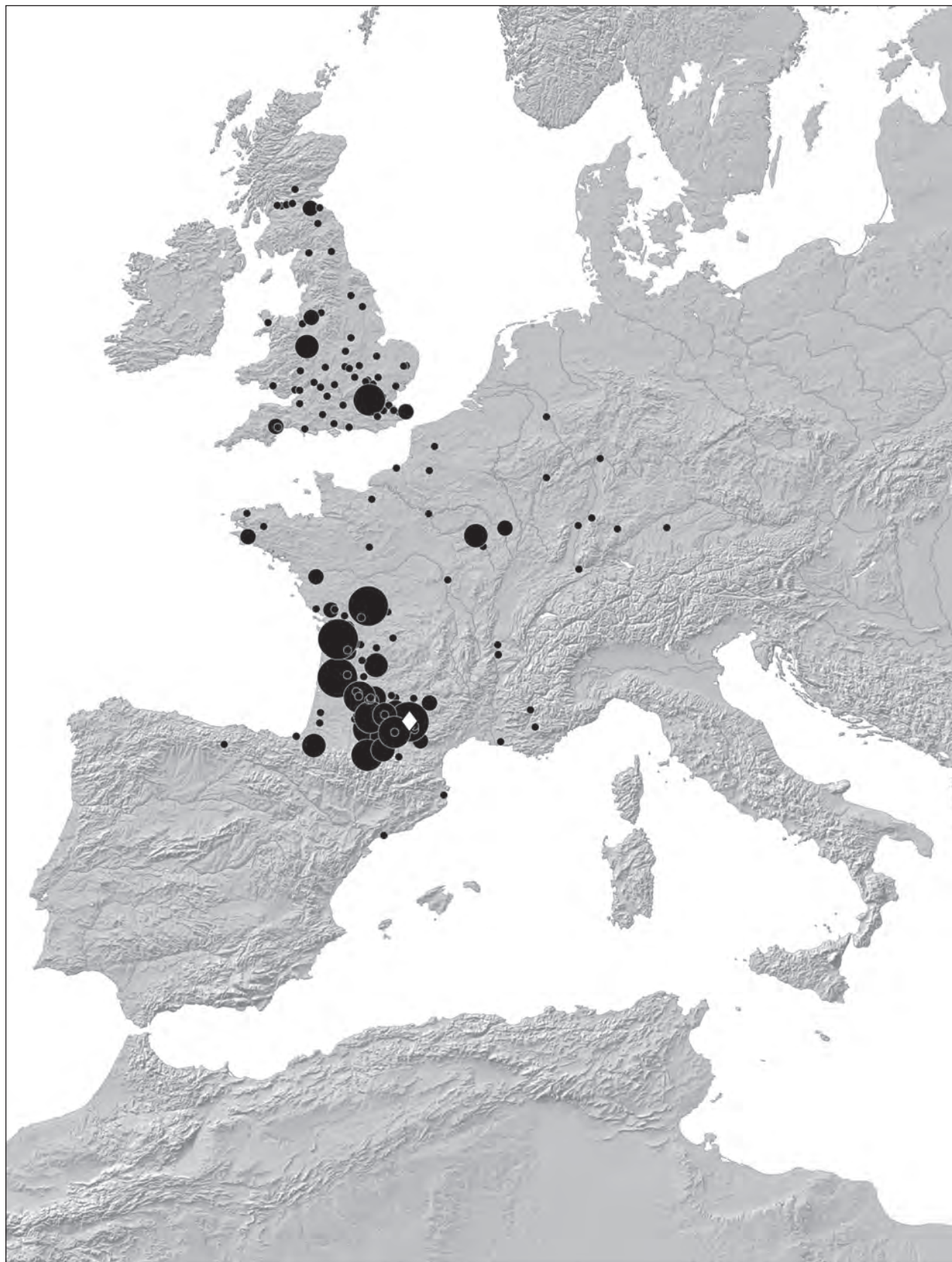


Fig 6. The incidence of stamped samian produced at Montans of the second century AD. The diamond denotes the production centre



Fig 7. The incidence of stamped samian produced at Les Martres-de-Veyre. The diamond denotes the production centre

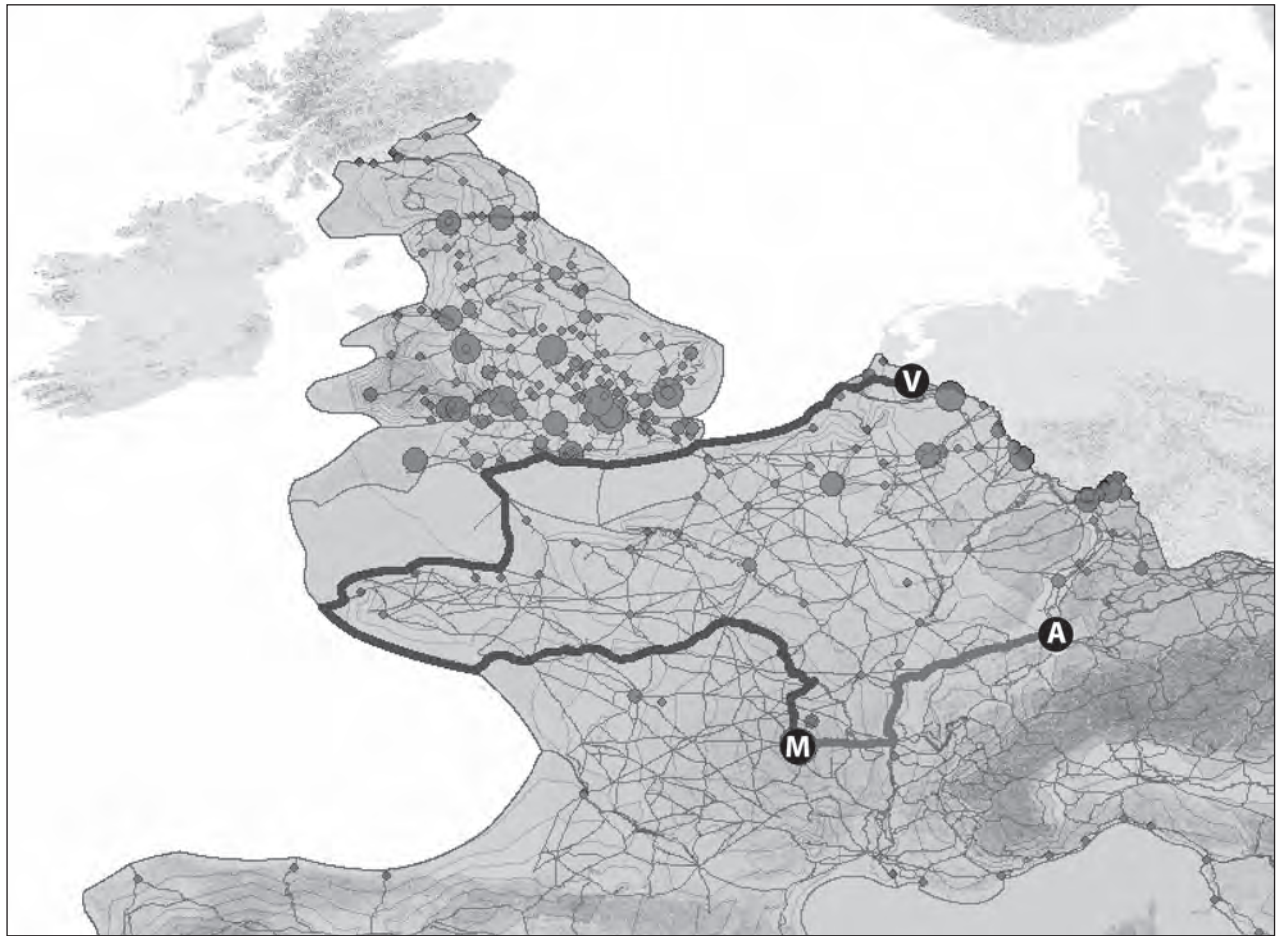


Fig 8. Map of the transport costs from Les Martres-de-Veyre. Highlighted are the 'least-cost' routes from Les Martres-de-Veyre towards Vechten (black line to V) and towards Augst (grey line to A). Dots are distribution sites of samian from Les Martres-de-Veyre. Transport factors applied are: sea (1), river (5) and land (28)

Table 1. The incidence of stamped vessels from Les Martres-de-Veyre by site

Site	No. of Examples
Les Martres-de-Veyre	165
Clermont Ferrand	16
Augst	6
Cannstatt	5
Mainz	12
Hanau-Salisberg	6
Bonn	11
Neuss	6
Nijmegen	27
Vechten	24
Tongeren	15
Bavay	9
Paris	8
London	137
Verulamium	23
Colchester	22
Chichester	11
Exeter	13
Caerleon	12
Chester	16
Corbridge	15
Carlisle	11

For Lezoux the patterning is again rather different (Fig 9). Given that the production was far larger, and lasted far longer than its earlier central Gaulish competitor at Les Martres-de-Veyre, the strength of supply to the Bavay/Paris/Amiens axis is clear, with Rouen and the Seine estuary showing as a probable exit route. The late group from Rezé (*Portus Ratiatus*) discussed at the Amsterdam conference of the Study Group by Gwladys Monteil and Richard Delage (Delage *et al* 2011) suggests that another outlet via the Loire had been established (there may be some skewing in the data here caused by gaps in the coverage of *Names on Terra Sigillata*). The break between Mainz and the Saalburg and Bonn to the north may be influenced by the disposition of sites, or may be a real routing choice, with the former linked to the Augst/Strasbourg axis, while the latter may reflect the back-loading established for Les Martres-de-Veyre.

The use of the Rhine and its deltaic ports for Rheinzabern is so clear that it needs little comment (Fig 10), other than to point out that by this date, if not earlier for Lezoux products, besides London there were almost

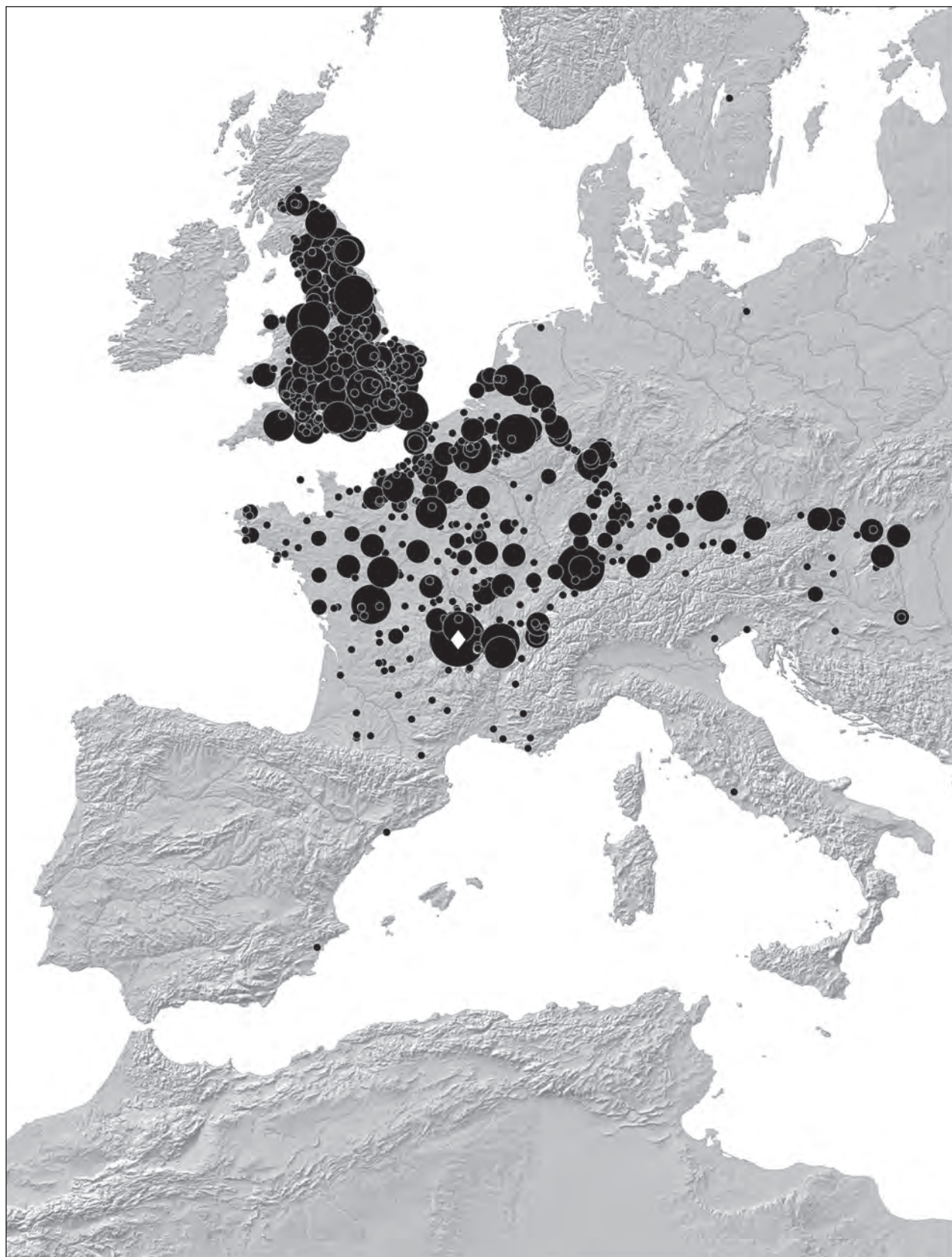


Fig 9. The incidence of stamped samian produced at Lezoux. The diamond denotes the production centre

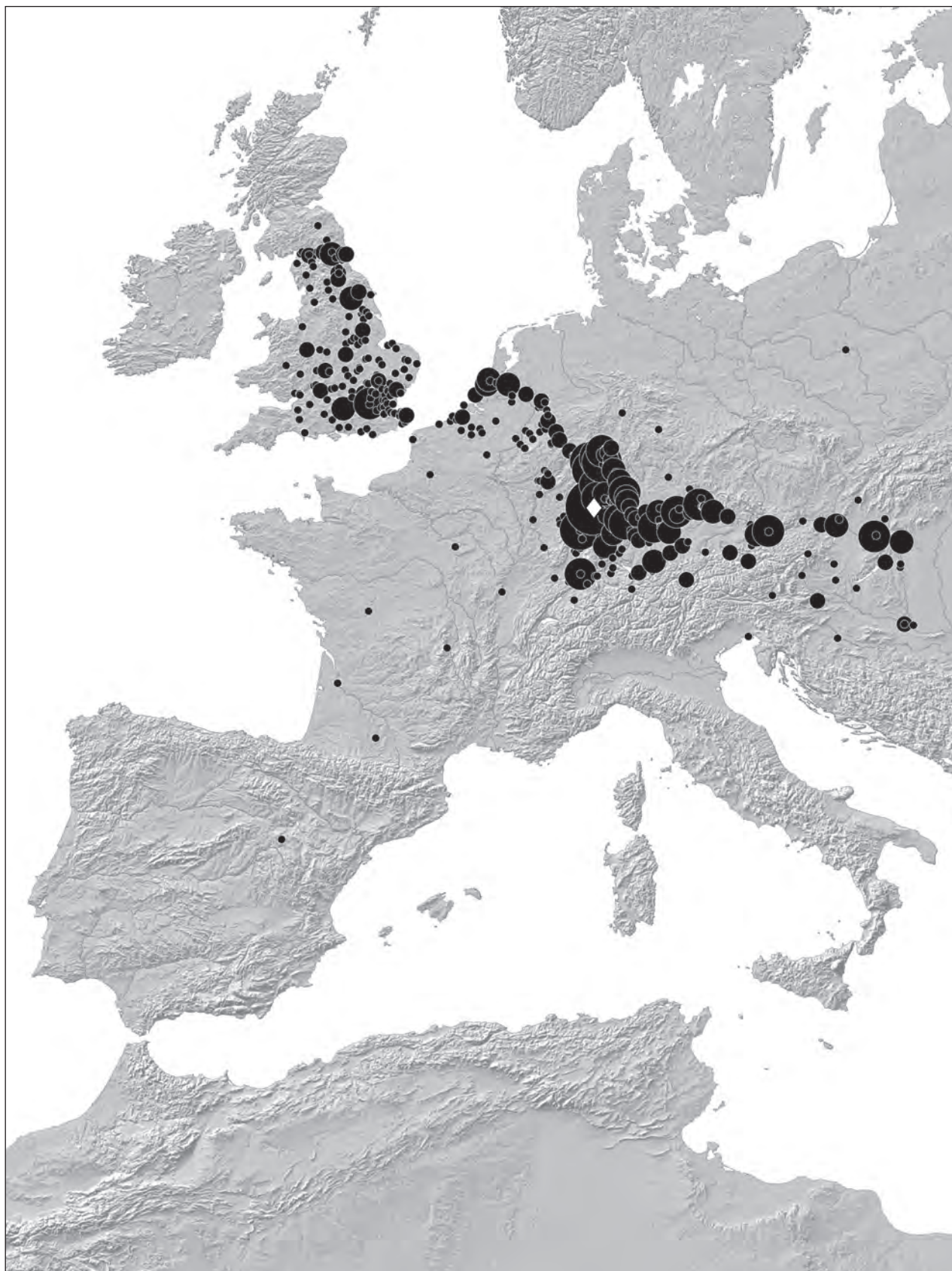


Fig 10. The incidence of stamped samian produced at Rheinzabern. The diamond denotes the production centre

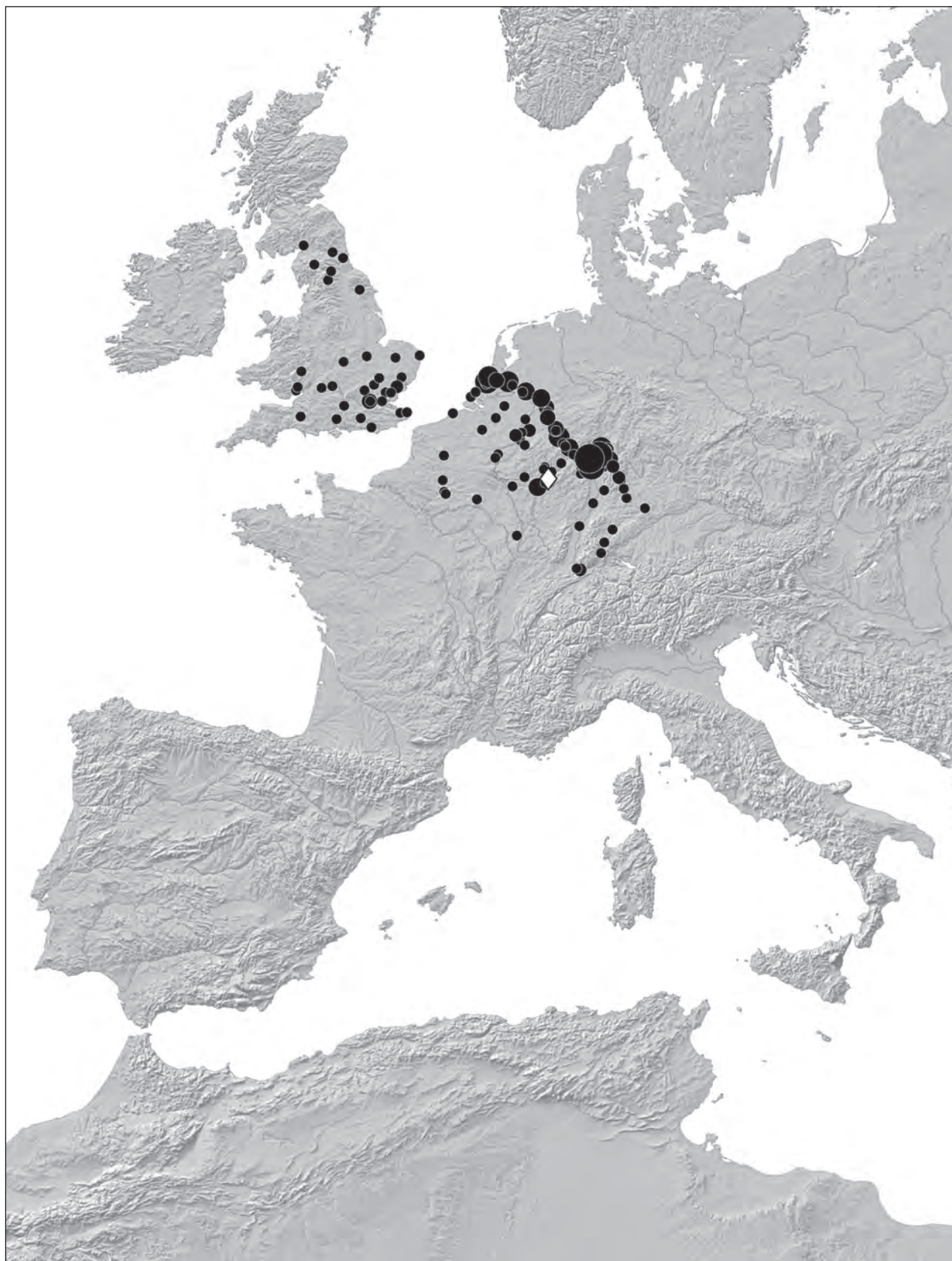


Fig 11. The incidence of stamped samian produced at Trier. The diamond denotes the production centre

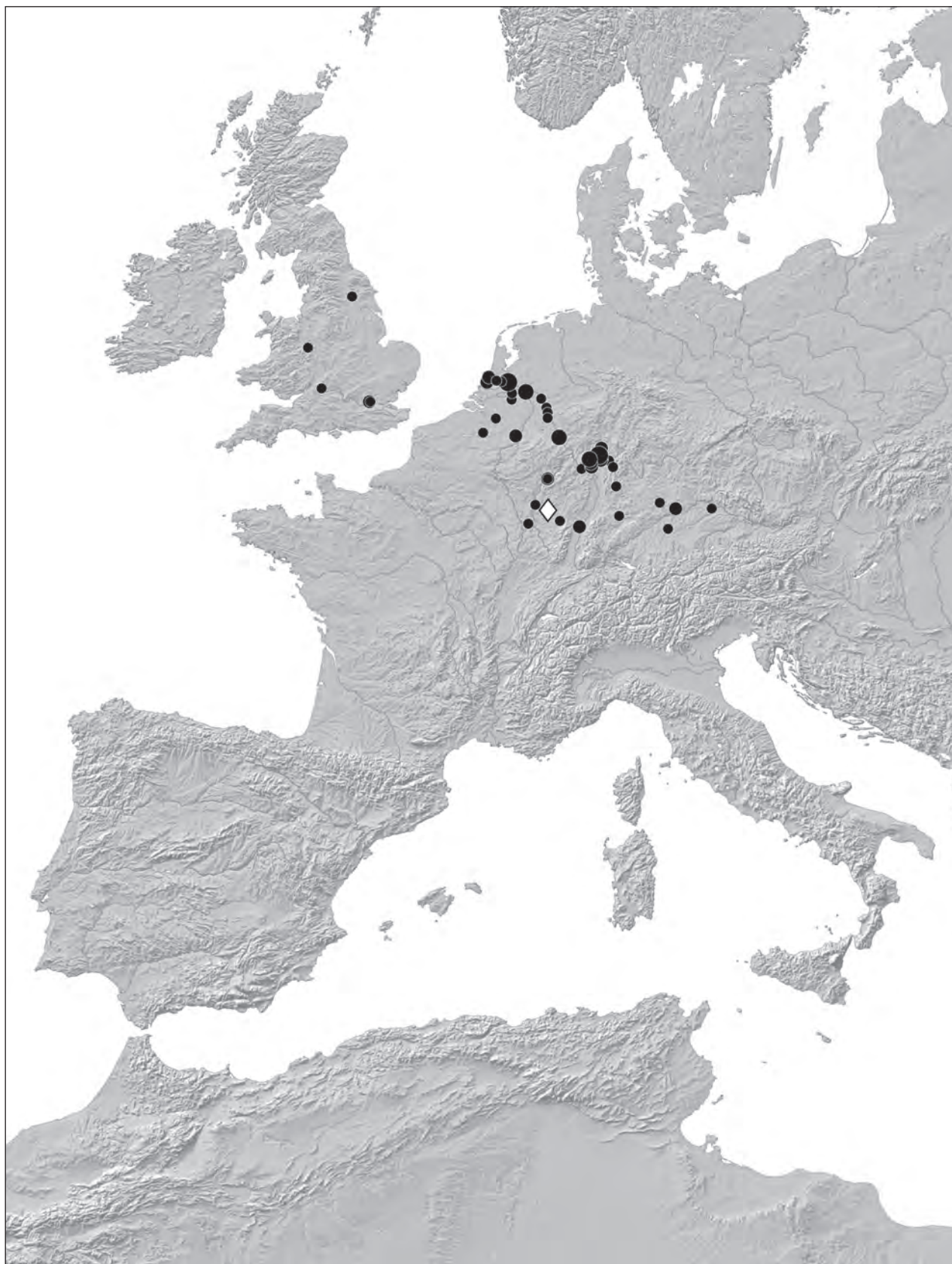


Fig 12. The incidence of stamped samian produced at Chémery-lès-Faulquemont. The diamond denotes the production centre



Fig 13. The incidence of decorated samian produced at Colchester: The diamond denotes the production centre

certainly direct shipments to York and South Shields, to service the military establishments of northern Britain.

Of the lesser East Gaulish and German production sites Figure 11 shows the distribution for Trier samian ware pottery, which looks as if it was carried on the same routes as that of Rheinzabern. For Chémery-lès-Faulquemont (Fig 12) the evidence for Britain is very slight, and we would think that wares from minor potteries such as this are being picked up en route spasmodically with other goods, and again redistributed through London.

Finally, we thought it would be useful to show the distribution of the Colchester samian ware kilns, if only to emphasise how a very distinctive ware, in competition with far larger producers, is confined regionally (Fig 13).

4. Summary

While these maps suggest interesting trade route differentiation they emphasise that to be effective such studies need to be multi-disciplinary to carry conviction. We would make three points. Firstly, much more quantitative work needs to be done with comparable statistical methodology, to establish vessels populations at individual sites. Second, it is essential to begin to build databases of other artefacts with geographical co-ordinates so that integrated trade patterns can be established. Third, the huge pulling power of London for Britain is obvious. However, comparisons between site-types will reflect both their contemporary populations and, of course, the amount of excavation on them. So, where we have similar numbers of finds, say at the 20 example level, we need to be in a position to estimate the significance of one site when compared with another (*cf* Willis 2005, for a multi-faceted approach).

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Pottery production in Roman Cologne: A summary of old and new finds

Constanze Höpken

1. Introduction

The first settlement of Cologne – the oppidum Ubiorum – was founded by the Romans on the river Rhine in what is now north-west Germany, in the last centuries BC. In AD 50 it became the colony Colonia Claudia Ara Agrippinensium and around AD 80 the colony became the capital of the newly created province of Germania Inferior. In the second century the new capital was a focal point of a flourishing economy, integrated in the international business of the Roman Empire. Between AD 259/260 and 274 the city became the capital of the Gallic Empire and in 355 it was plundered by the Franks. Finally in the fifth century Cologne became a Frankish town (*cf* Eck 2004). In almost every era of its history pottery production is a proven industry in Cologne (Höpken 2005a; Höpken and Liesen 2005; Höpken unpublished).

At the heart of the pottery industry was the use of an excellently suitable white clay, which can be found in extended tertiary clay deposits west of Cologne in the lower Rhine basin; this source has been exploited until modern times. Overlying lignite with humic acids dissolved iron and improved the quality of the raw material. These deposits are accessible in tectonic faults which run north–south about 10 km west of Cologne (Goebels 1971, 29). The clay was transported over this distance to Cologne and the production took place in the settlement near the customers and markets. Only a very few workshops used an iron rich clay and that was for a short period; these latter vessels form a very small fraction of Cologne products (Höpken 2005b).

In the early first century the necessary firewood was most likely taken from forests to the north, west and south of the settlement but with the subsequent establishment of a surrounding villa system, the land was cleared to grow crops and most of the forests were destroyed (Bunnik *et*

al 1995, 180). So it seems probable that from the second century onwards the firewood was taken from the other side – the barbarian side – of the Rhine.

In the city of Cologne about 50 Roman pottery production sites are known – mostly through excavations (Fig 1). A few more can be detected by their products, like the workshop of P. Flos (Biegert and Schnurbein 2003). In this case no kiln site has been identified to date but chemical analysis suggests a Cologne production site and the products are found in Cologne and beyond. In assessing Cologne production, the pottery found at the kiln sites has been divided into produced material – defined by the fabric, the number and size of the sherds and the appearance of wasters – and consumption material.

2. The Early First Century

In the early first century potters immigrated to conquered land to set up their businesses. This was so at the oppidum Ubiorum, before it became Colonia Claudia Ara Agrippinensium. Within and around the newly founded city they made vessels following an Italian or a Gallo-Roman tradition – depending on where they came from. For example, the (not yet located) workshop of P. Flos produced imitations of plain terra sigillata/Arretine ware (Biegert and Schnurbein 2003) while another workshop, situated south of the centre, specialized in imitations of decorated samian ware, which is proven by wasters and moulds (Fig 1 site D; Euskirchen and Wieland 2011). Also following the Mediterranean tradition are the products of workshops nearby, of which waster heaps could be identified (Fig 1 site B, Fig 7, and Fig 1 site C, Fig 8). On the other hand some workshops produced terra nigra and Roanne-type bowls, which are of Gallo-Belgic and



Fig 1. The Roman pottery workshops of Cologne dated to the first to fourth centuries AD (Sites where the kiln/s have been identified are depicted by small kiln symbols; triangles show where production is only known from waster evidence. Site 19 does not appear on the map as the precise production site of the recovered material is not known). See catalogue for details (Table 1).

Celtic/Iron Age origin, respectively (Fig 1 sites 01, 04, 08 and 13). Gallo-Belgic pottery was also probably made at a site with three kilns, excavated in 2006 (Fig 1 site A, Fig 6). The Ubii, however, the Germanic tribe which was moved from the upper Rhine region to Cologne, are not detectable through the production sites or by any distinctive vessels.

Within one workshop west of the centre (cat no 8 Lungengasse 19–29: Fig 1 site 08) the kilns can be divided into three phases, by tradition, raw material and technology (Höpken 2005a, 230–62; 2005b). In the first phase, four round kilns with concentric supports were constructed. Each of two pairs were lying next to each other, using the same working pit. From the production, only some small white beakers of Italian style survived (Fig 2 T15). In the second phase, two round kilns, again using the same pit, were built to fire pottery mainly of Gallo-Belgic style (Fig 2 W1), using iron-rich red clay, but also individual Roman/Italic forms. In the third

phase a completely different kiln type was used to fire Gallo-Belgic and reduced coarse ware. The pots were not located above but behind the fire as in medieval times. So the first phase – using oxidised firing atmosphere in the kiln – seems to follow Mediterranean customs, the second Gallo-Roman customs and in the third phase a different kiln technology was used and the output increased. The timespan of this workshop ranges from the early to the mid-first century. The output must have been large, but not as large as the production of industrial style in the neighbourhood with 19 kilns (Carroll 2004). Here there are regular-sized kilns to fire coarse wares (cat no 7 Lungengasse 35: Fig 1 site 07) and large kilns to fire dolia and mortaria (Fig 2 S2). To temper the raw material for the dolia and mortaria fragments of plain ware wasters were collected and employed. For the mortaria only white fragments were used, while for the dolia white and orange fragments were included; it seems likely that wasters of the neighbouring workshop were used for this purpose.

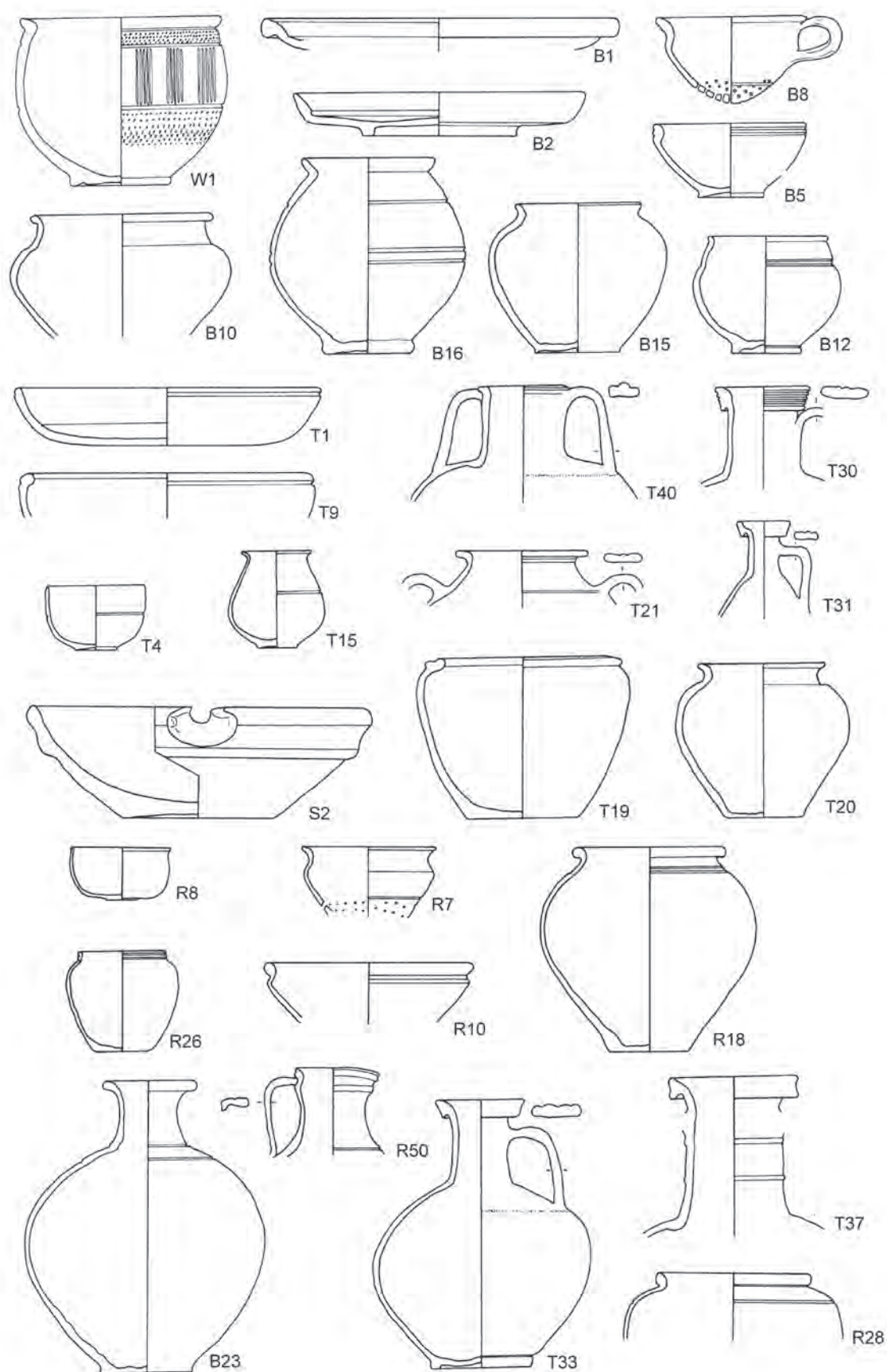


Fig 2. A selection of pottery produced in Cologne in the first half of the first century (scale approximately 1:6).

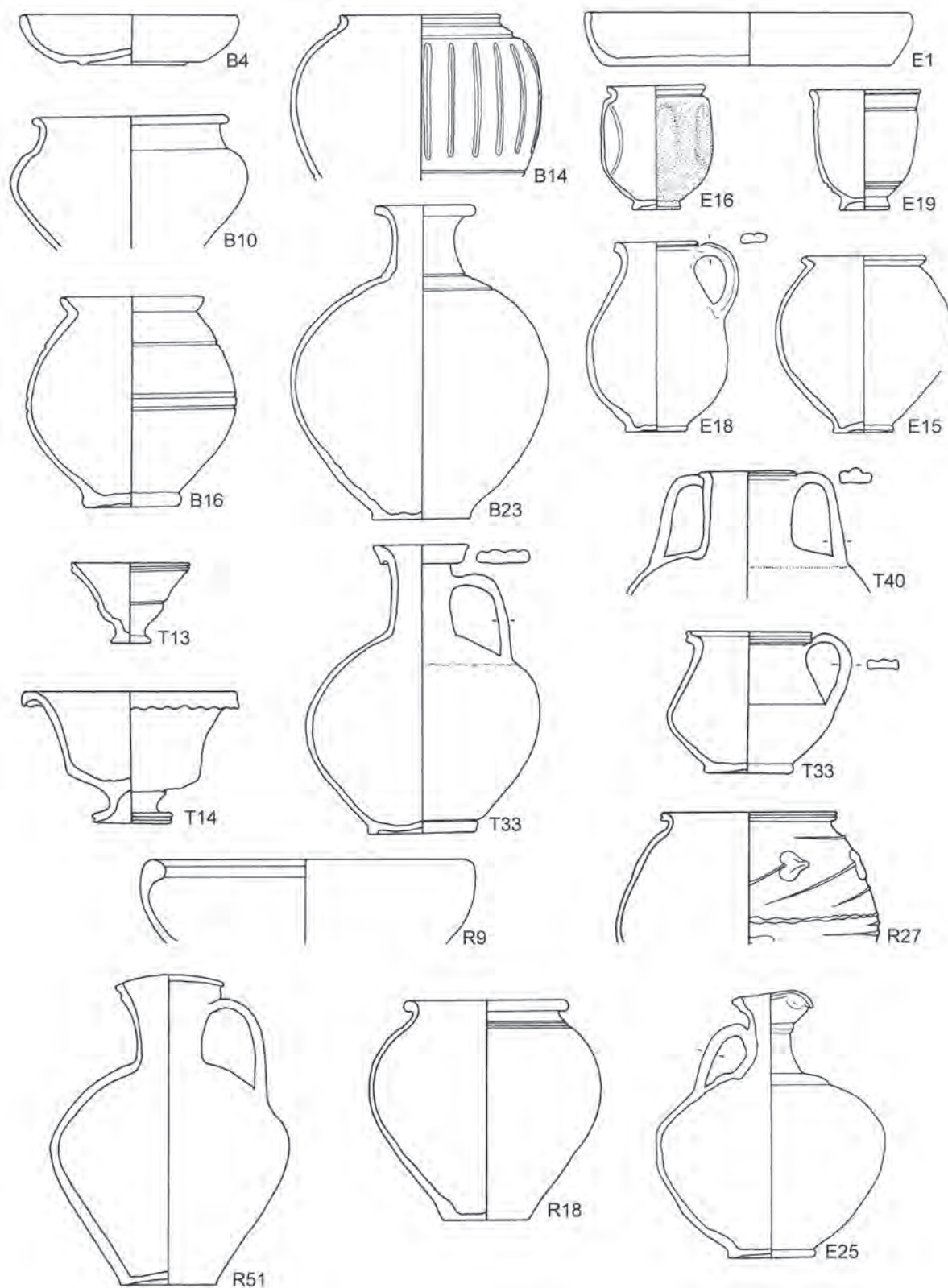


Fig 3. A selection of pottery produced in Cologne in the second half of the first century (scale approximately 1:6).

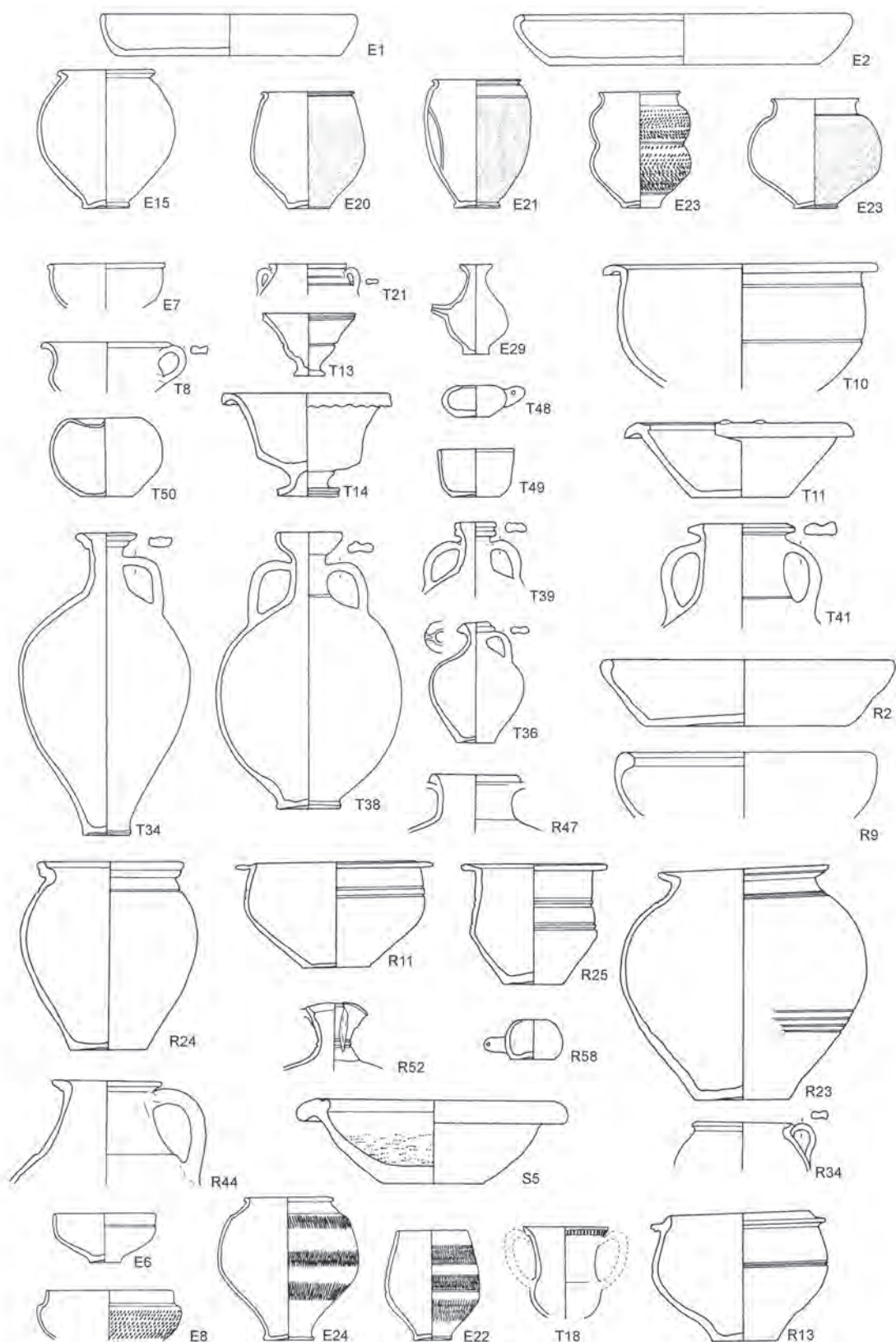


Fig 4. A selection of pottery produced in Cologne in the second century (scale approximately 1:6).

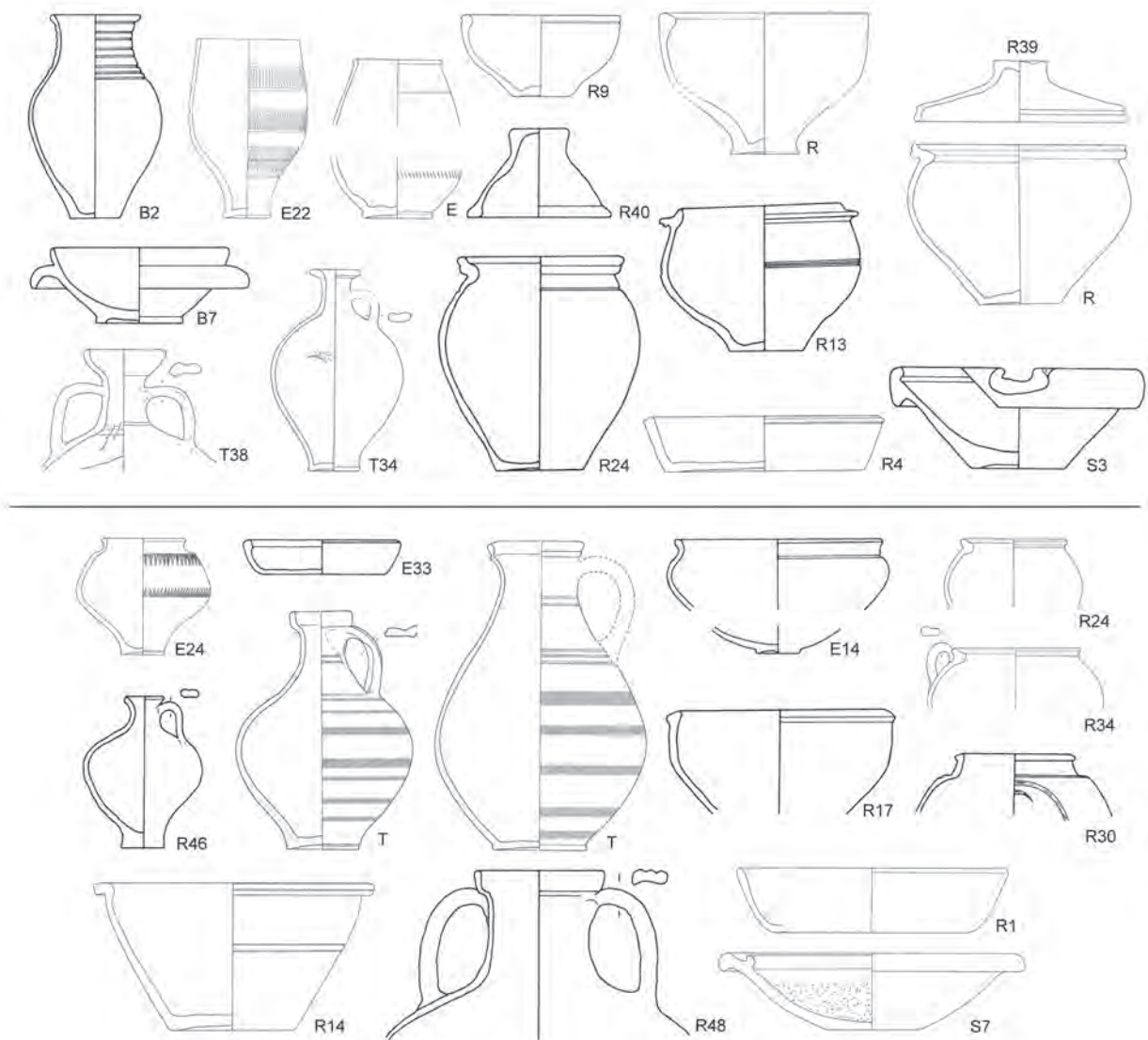


Fig 5. A selection of pottery produced in Cologne in the third and fourth centuries (scale approximately 1:6).

3. The Second Half of the First Century

Around the mid-first century when the oppidum Ubiorum became a colony the system of pottery production in Cologne and its hinterland changed. In the hinterland it seems that the potters gave up their business and the workshops in the city centre move to the suburbs. This is indicated by the case of one potter, working first close to the centre (cat no 2 Olivandenhof/Zepelinstraße 9: Fig 1 site 02), who made a special type of pottery – reduced thin walled but coarse ware (Fig 2 R8, R26, R50), who evidently moved in the southern suburbs carrying on this production there (cat no 11 Georgstraße 20: Fig 1 site 11).

In the second half of the first century the spectrum of pottery developed more and more into a local style (Fig 3), combining Italian and Gallo-Roman elements. It seems likely that the production of slipped wares began in Cologne quite late compared to Xanten and

Nijmegen (Höpken 2005a, 43). In the second half of the first century in several workshops (cat nos 14 and 15 Bahnhofsvorplatz and Mauritiussteinweg/Marsilstein 1: Fig 1 sites 14 and 15) contemporary terra nigra and slipped ware were produced, but thereafter the production of terra nigra was abandoned and completely replaced by slipped ware (Fig 3).

4. The Second Century

In the second century a pottery centre arose west of the city in the area of today's Rudolfplatz (Fig 1 sites 19–40). The range of pottery produced comprised plain and coarse wares and slipped wares like the well-known hunt cups – but no further typically first century Gallo-Belgic wares (Fig 4). In general the production of hunt cups on the continent had seemed to have been restricted to Cologne,



Fig 6. Kämmergasse (site A in Figure 1). Kilns, excavated 2006.

where in addition to hunt scenes, a few gladiators and sportsmen are also represented, however, a find from Bonn, in the form of a misfired but usable green-glazed beaker with a gladiator scene, forces us to rethink this question (Höpken *et al* 2011, 141–2). Specifically mould-made objects like figures and masks were made by artists who signed their products: Servandus, Alfius, Videx and Priscus (Höpken 2005a, 44–51, 414–25; Binsfeld 1964, 30–1). Some of these workshops seem to have specialized in devotional objects and vessels, including green-glazed ware. The high quality products were shipped long distance via the Rhine to Switzerland and Britain. In particular the hunt cups can be found in many Roman settlements in the North-West provinces (Oenbrink 1998).

5. The Decline of the Production

The decline of this pottery centre began at the end of the second century. It seems that merchants from Trier controlled the trade along the Rhine to the exclusion of Cologne products. The potters thereby lost their economic base and moved into the hinterland, for example to Aachen

and Soller, and carried on exporting, especially mortaria, to Britain from there (Haupt 1981). In Cologne plain, coarse and slipped wares were still made but in smaller quantities (Fig 5, upper section). Two workshops are known (cat no 41 and E Achterstraße75/Severestraße 154 and Luxemburger Straße/Hochstadtstraße: Fig 1 site 41 and site E), and certainly there must have been more production sites in the third century. However, as grave goods, as well as the finds material of Cologne in general, shows, much pottery was imported from Trier and also from Urmitz. In particular the imported Trierer Spruchbecher were very popular and can be found in many graves.

6. The Fourth Century

Finally, for the fourth century we know of only one workshop, lying west of the city (cat no 42 Humboldtstraße 41: Fig 1 site 42), but the products – jugs with red stripes (Fig 5, lower part, middle) are easily identifiable and also occur outside of the city (Liesen 1999). Nevertheless, many production sites seem to be missing, if we compare

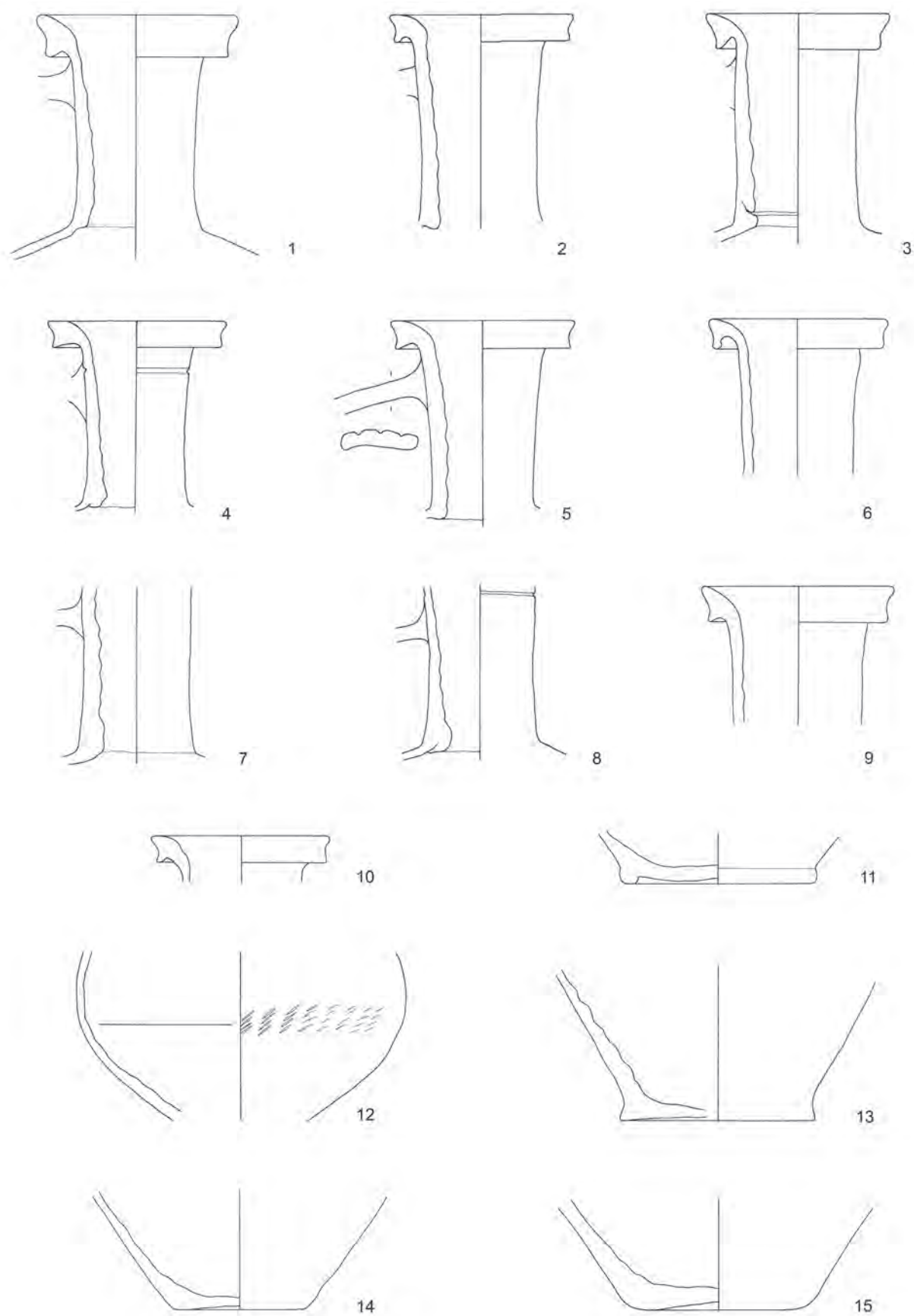


Fig 7. Severinstraße 222–228 (site B in Figure 1). Wasters.

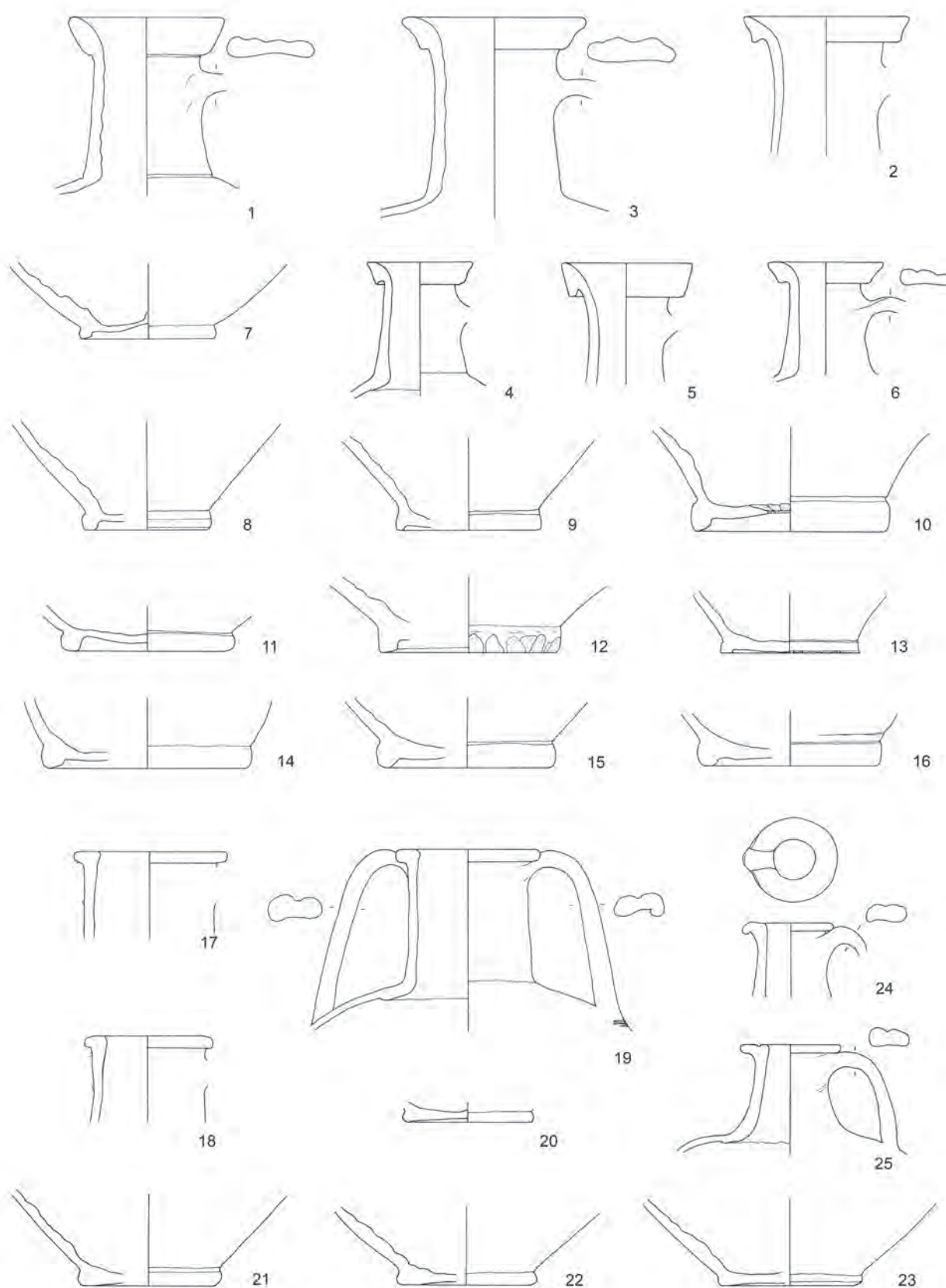


Fig 8. Georgstraße 7 (site C in Figure 1). Wasters.

Table 1. Catalogue of workshop sites in Cologne (see Fig 1)

No.	Name	Date	Evidence	Produced wares	Bibliography
1	Rechtschule	Early 1st century	1 kiln	Gallo-Belgic, plain, coarse	Höpken 2005a, 155–70
2	Olivandenhof	2nd quarter of 1st century	1 kiln	Thin-walled coarse	Höpken 2005a, 171–6
3	Richmodishaus (Neumarkt 8–10)	2nd quarter of 1st century	2 pits	Lamps, Gallo-Belgic?	Höpken 2005a, 177–81
4	Neumarkt 47	1st half of 1st century	8 pits	Gallo-Belgic?, coarse?	Höpken 2005a, 182–6
5	Neumarkt 43	1st half of 1st century?	depression in street filled with wasters	Unknown	Höpken 2005a, 187
6	Neumarkt 41	Early 1st century	2 pits	Plain, coarse	Höpken 2005a, 188–93
7	Lungengasse 35	1st half of 1st century	19 kilns, several pits	Coarse, mortaria, dolia	Höpken 2005a, 194–229
8	Lungengasse 19–29	1st half of 1st century	12 kilns, 3 pits	White-red, Gallo-Belgic, plain, coarse	Höpken 2005a, 230–62
9	Waidmarkt/Blaubach	Early 1st century (before mid-1st century)	2 kilns, 3 pits	Mould-made, sigillata imitations, plain, coarse	Höpken 2005a, 263–8; see also Euskirchen and Wieland 2011
10	Georgstraße 5	Early 1st century	1 pit	Plain	Höpken 2005a, 269–70
11	Georgstraße 20	Mid-1st century	1 kiln	Thin-walled coarse	Höpken 2005a, 271–3
12	Severinstraße 241	Mid-1st century	1 kiln	Plain, coarse	Höpken 2005a, 274–5
13	Weyerstraße 48	3rd quarter of 1st century	Waster heap	Gallo-Belgic, coarse	Höpken 2005a, 276–8
14	Bahnhofsvorplatz	2nd half of 1st century	13 kilns	Lamps, slipped, Gallo-Belgic, plain, coarse, mortaria	Höpken 2005a, 279–308
15	Mauritiussteinweg/Marsilstein 1	4th quarter of 1st century	11 kilns, 1 pit	Mica-dusted, slipped, Gallo-Belgic, plain, coarse, mortaria	Höpken 2005a, 309–41
16	Marsilstein 11	4th quarter of 1st century	Waster heap	Slipped, plain, coarse	Höpken 2005a, 342
17	Neue Weyerstraße 33–41	Early 2nd century	1 kiln	Coarse	Höpken 2005a, 343–5
18	Cäcilienstraße/Neumarkt	2nd century	Wasters used as landfill	Mould-made, sigillata imitations?, slipped, plain, coarse	Höpken 2005a, 346–54
19	Rudolfplatz (south side)	2nd century	Waster heap	Slipped	Höpken 2005a, 355–7
20	Rudolfplatz/Habsburgerring	Early 2nd century	Waster heap	Mould-made?, slipped, plain, coarse	Höpken 2005a, 358–63
21	Aachener Straße/Habsburgerring	1st half of 2nd century	Waster heap	Mould-made, glazed, mica-dusted, slipped, plain, coarse	Höpken 2005a, 364–71
22	Aachener Straße/Habsburgerring (south-west corner)	Early 2nd century	4 kilns, 3 pits	Slipped, plain, coarse, mortaria	Höpken 2005a, 372–85

No.	Name	Date	Evidence	Produced wares	Bibliography
23	Rudolfplatz (north side)	2nd quarter of 2nd century	Waster heap	Slipped, coarse, probably plain	Höpken 2005a, 386–7
24	Mauritiuswall 20	2nd quarter of 2nd century	2 pits/waster heaps	Glazed, slipped, plain, coarse	Höpken 2005a, 388–93
25	Aachener Straße 52/Brüsseler Straße	Mid-2nd century	1 kiln, 1 pit	Slipped, coarse	Höpken 2005a, 394–9
26	Aachener Straße/Habsburgerring (south-west side)	Mid-2nd century	Waster heap, worked clay pit	Mould-made, glazed, slipped, plain, coarse, probably mica-dusted	Höpken 2005a, 400–6
27	Aachener Straße/Engelbertstraße	Late 2nd century	Waster heap, probably belonging to workshop 31	Slipped, coarse	Höpken 2005a, 407–9
28	Vindex workshop	1st half of 2nd century	5 kilns, waster heap	Mould-made, slipped, plain	Höpken 2005a, 414–9
29	Alfius workshop	2nd half of 2nd century	Kilns	Mould-made	Höpken 2005a, 420–1
30	Servandus workshop	2nd half of 2nd century	Kilns, waster heaps	Mould-made, slipped	Höpken 2005a, 422–5
31	Händelstraße/Engelbertstraße	2nd half of 2nd century	1 kiln?, 2 pits, clay stock?, waster heap	Mould-made, glazed, slipped, plain, coarse	Höpken 2005a, 426–33
32	Rudolfplatz (north-west of Hahnentor)	2nd half of 2nd century	Waster heap	Slipped, plain, coarse	Höpken 2005a, 434–5
33	Habsburgerring 28–30/Rudolfplatz 7–9	2nd half of 2nd century	1 kiln, 1 pit, waster heap	Mould-made?, glazed, mica-dusted?, slipped, plain, coarse	Höpken 2005a, 436–51
34	Habsburgerring 30	Late 2nd century	Waster heap, 2 wells	Slipped, plain, coarse	Höpken 2005a, 452–9
35	Habsburgerring 2–12	Late 2nd century	2 kilns	Glazed, slipped, plain, coarse	Höpken 2005a, 460–72
36	Rudolfplatz (west of Hahnentor)	Late 2nd century	3 kilns, 4 pits, waster heaps	Mould-made, slipped, plain, coarse	Höpken 2005a, 473–90
37	Hahnenstraße 5 (former Mauritiuswall 112)	Late 2nd century	1 pit	Mould-made?, glazed?, slipped, plain, coarse	Höpken 2005a, 491–6
38	Habsburgerring	Late 2nd century	1 pit, waster heap	Mould-made, glazed?, slipped, coarse	Höpken 2005a, 497–9
39	Hahnenstraße 29–37 (former Apostelnkloster 3)	2nd half of 2nd century	1 pit, parts of 1 kiln, waster heap	Mould-made, slipped?, plain, coarse	Höpken 2005a, 500–4
40	Richard-Wagner-Straße 32–36	Late 2nd century	Waster heap	Mould-made, slipped, plain, coarse	Höpken 2005a, 505–11
41	Achterstraße 75/Severinstraße 154	2nd quarter of 3rd century	1 kiln, 1 pit	Gallo-Belgic, slipped, plain, coarse	Höpken 2005a, 512–26; see Reuter 2007, 448
42	Humboldtstraße 41	1st half of 4th century	1 kiln, 1 pit	Gallo-Belgic, slipped, plain, coarse	Höpken 2005a, 527–38
43	Zülpicher Platz	Unknown	2 kilns	Unknown	Höpken 2005a, 539

No.	Name	Date	Evidence	Produced wares	Bibliography
44	Maria-Ablaß-Platz	Unknown	Unknown	Unknown	Höpken 2005a, 540
A	Kämmergasse	1st half of 1st century	3 kilns	Plain	unpublished
B	Severinstraße 222–228	1st half of 1st century	Waster heap	Plain	unpublished
C	Georgstraße 7	1st half of 1st century	Waster heap	Plain	unpublished
D	Waidmarkt	1st half of 1st century	Moulds	Imitations of decorated sigillata	Euskirchen and Wieland 2011
E	Luxemburgerstraße /Hochstadenstraße	2nd third of 3rd century	2 pits, 1 kiln?	Slipped, plain?, coarse	Höpken and Liesen 2005

the amount of production from the known sites and the ceramic needs of the biggest city in the province.

7. Conclusion

With this overview it becomes obvious that the pottery production in Cologne began as a heterogeneous system reflecting different geographical-cultural influences. The products show on the one hand influences directly from Italy, so it can be assumed that Italian potters or those adhering to such a tradition moved to Cologne. On the other hand Romanized pottery as it was produced in Gaul can be found which demonstrates that potters from Gaul also came to Cologne. Out of these different influences in the late first century a regional spectrum was developed which became widespread via the export south along the Rhine and north to Britain till the end of the second century. In the third and fourth centuries only a few production sites are known. This is not a coincidence or caused by ‘missing sites’ rather it reflects a tendency shown by the pottery being used in the city at that time: in addition to pottery produced in Cologne, many vessels were, by that period, being imported from Urmitz/Weißenturm and Trier.

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The Ancient Tripolitanian amphora: the evidence from France and the recent excavation at Toulouse ‘caserne Niel’

Matthew E. Loughton and Laurence Alberghi

1. Introduction

The last couple of decades have seen a vast improvement in our understanding of amphora production in Tunisia during the Roman period. Most notable is the recent typological synthesis by Michael Bonifay (2004), while great advances have been made in assigning amphorae to different production centres (for example Bonifay *et al* 2010; Ghalia *et al* 2005; Mrabet and Ben Moussa 2007) and identifying the commodities they contained (Ben Lazreg *et al* 1995; Bonifay 2007; Slim *et al* 2007). In contrast, less work has been devoted to Tripolitanian amphorae (Panella 1973; 1977; Zevi and Tchernia 1969, 193–5) and this is especially true of the late Republican Ancient Tripolitanian amphora (Bonifay 2005). Partly, this is down to its recent identification (Liou and Pomey 1985, 567, 569; Empereur and Hesnard 1987) and the limited number of find-spots known from Mediterranean Europe. While several studies have examined the evidence concerning the dating and the distribution of this amphora in Spain and Portugal (Pascual Berlanga and Ribera Lacomba 2002; Mateo Corredor 2012; Asensio *et al* 1998) the evidence from France has not received a similar treatment. Furthermore, many questions concerning the origin, chronology and frequency of this amphora remain unclear. This article will collate and discuss the evidence from France and will make considerable use of the finds from the recent large-scale excavation on the Late Iron Age trading and industrial settlement at Toulouse ‘caserne Niel’ (Fig 11 site 1). This excavation has provided one of the largest assemblages of Ancient Tripolitanian amphorae and one that helps to clarify our knowledge of this amphora.

2. The Ancient Tripolitanian amphora

The Ancient Tripolitanian amphora (hereafter referred to as AT amphora or amphorae) is ovoid in shape (height *c* 0.7–0.8 m) with a short triangular or vertical rim, a short neck (*c* 10–15 cm) with two rounded handles (often indented at the base), and a simple button-like base (Fig 1). It has been estimated that it had a capacity from 42 to just under 50 litres (Benquet and Olmer 2002, 320) while later Tripolitanian I’s from Pompeii held between 50–61 litres with a median of 56 (Panella 1977, 141). The fabrics of these amphorae suggest that they were manufactured in coastal Tripolitania (eastern Tunisia and Libya) especially around the cities of *Oea* (Tripoli), *Sabratha* and *Lepcis Magna*. At the moment, none of the amphora kilns from Tripolitania are known to have manufactured the AT amphora (Mattingly 1988a, 37–8; 1988b, 32; 1995, 153; Ahmed 2010, 246–7; Ciotola and Munzi 2012). Instead, the kilns at *Zitha/Zian* and *Gallala* in western Tripolitania (Tunisia) were firing copies of the Dressel 2–4 and the Tripolitanian I and III (Bonifay 2004, 29; Bonifay *et al* 2010, 325–6). On the island of *Jerba* off the coast of eastern Tunisia Punic/Neo-Punic (Van der Werff 2, 3/Maña C1, C1/2) and Tripolitanian I amphorae were being produced (Fontana *et al* 2009, 271–7). Roman kilns from the hinterland of *Lepcis Magna* were producing Tripolitanian I–III amphorae (Arthur 1982). The recent work of Ahmed (2010) although greatly increasing the number of amphora production centres in the Gebel south of *Lepcis Magna*, failed to find any firing the AT amphora. A recent survey of a 25 km coastal strip west of *Lepcis Magna* found several kilns connected with the Tripolitanian I and II (Schörle and Leitch 2012; Capelli and Leitch 2011). Finally, kilns

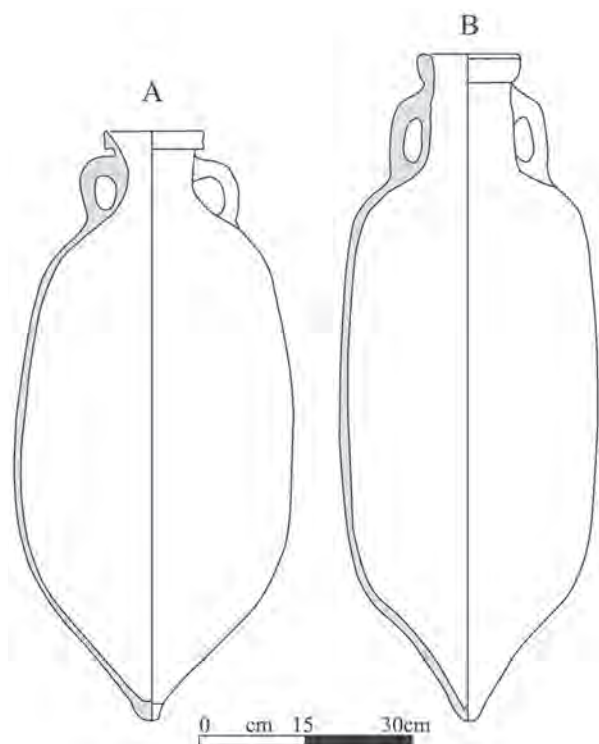


Fig 1. The Ancient Tripolitanian amphora (A) and Tripolitanian I (B) (after Sciallano and Sibella 1991)

recently discovered at Tripoli were firing the Mau 35, a smaller copy of the Dressel 2–4 (Reynolds 2010, 237, note 35). The majority of these Tripolitanian amphora kilns date from the first century AD onwards and only the kilns at Jerba, which were firing the Van der Werff 2 and 3, were active during the second and first centuries BC. At present a Tripolitanian origin for the AT amphora cannot be proved.

The type has sometimes been referred to as the Tripolitaine I précoce (Benquet and Olmer 2002, 319), Tripolitaine I ancienne and Dressel 26 ancienne (Empereur and Hesnard 1987, 35) although now in most French amphora reports it is referred to as the Tripolitaine ancienne. Researchers are divided as to whether the Dressel 26 can be equated with the type, although the recent discussion at the SFECAG conference at Arles in 2011 was of the opinion that they are different amphorae.

The AT amphora is taken as appearing during the later second century BC (Empereur and Hesnard 1987, 35–6) although some recent studies have suggested an earlier development during the first half of the second century BC (Pascual Berlanga and Ribera Lacomba 2002, 311). This form was succeeded in the Augustan period by the Tripolitanian I (Bonifay 2004, 101) (Fig 1).

As regards its distribution many find-spots are known from along the Mediterranean coast of Spain (Pascual Berlanga and Ribera Lacomba 2002, 304 fig 1; Mateo Corredor 2012, 122 fig 3) and southern Portugal (Bargão

2006; Pimenta 2005). In Spain AT amphorae have been recovered from urban sites (such as Valentia), a mining settlement (Fuenteovejuna ‘La Loba’), military sites (Cáceres el Viejo, Numantia), a cemetery (Villaricos), ports and sites involved in the production of amphorae (Cadiz). The majority of these find-spots date from the later second to the around the middle of the first century BC. In Italy there are examples at Ostia (Boersma et al 1986; Hesnard 1980) and Pompeii (Pascual Berlanga and Ribera Lacomba 2008), and Sicily at Mozia (Pascual Berlanga and Ribera Lacomba 2002, 304 fig 1). Examples are found scattered along the North African coast from Morocco (Aranegui Gascó 2005) to Tunisia and Egypt (Pascual Berlanga and Ribera Lacomba 2002, 304 fig 1). Finally, there is an example from Petra in Jordan (Panella 1977, fig LXIX no 43) and a possible vessel from Ashkelon, Israel (Johnson 2008, 145–6 no 422).

It is assumed that olive oil was the main commodity carried in the AT amphora given the evidence for large scale olive cultivation in Tripolitania during the Roman period (Mattingly 1988b; 1995, 138 ff). Nonetheless, find-spots of AT amphorae from Tripolitania are rare and they have not been recovered from oil producing sites in the region. There is convincing evidence to suggest that the later Tripolitanian I and III amphorae were olive oil containers (Bonifay 2004, 470). Painted inscriptions on vessels from Pompeii (Italy) and *Lepcis Magna* (Libya) refer to olive oil (Arthur 1982, 62) while Tripolitanian I’s are found at Monte Testaccio at Rome (Revilla Calvo 2007). Tripolitanian III amphorae have been recovered from several oil producing sites near to *Lepcis Magna* (Schörle and Leitch 2012). However, recent research is arguing for a greater role in the carrying of wine, garum and fish products in many African amphorae (Ben Lazreg et al 1995; Bonifay 2007; Slim et al 2007). It is assumed that the Tripolitanian II contained wine or garum, as some vessels are resin lined (Bonifay 2004, 470) and one kiln has recently been uncovered close to a maritime villa which was involved in the production of garum and/or salted fish (Capelli and Leitch 2011).

3. Toulouse ‘caserne Niel’

Toulouse and the nearby *oppidum* of Vieille-Toulouse in south-west France (Dept. Haute-Garonne) have long been famous for the enormous quantities of Republican amphorae, including large numbers of complete vessels, deposited in pits, wells and deep shafts during the Late Iron Age (Benquet 2007). The Saint-Roch quarter of Toulouse, south of the modern city centre, provides evidence for a major Late Iron Age open settlement covering an area of at least 40 ha which was heavily involved in long distance trade with the Mediterranean (Arramond et al 2007). The recent redevelopment of the old Niel military barracks (‘caserne Niel’) has for the first time allowed archaeologists to investigate a large portion

Table 1. Quantities of amphorae and seals from the 'caserne Niel' excavation

<i>Amphora Type</i>	<i>Sherd count</i>	<i>%</i>	<i>Weight (kg)</i>	<i>%</i>	<i>Rim count</i>	<i>Rim EVE</i>	<i>Rim EVREP</i>
Greco-Italic-Dressel 1	875,394	99.6%	97505	99.6%	32,663	5,706.1	-
All Exotic	3,571	0.4%	417	0.4%	320	73.0	236
Cement seals	245		4				
Total	879,210		97926		32,983	5,779.1	-
Main Exotic		% of exotic amphorae		% of exotic amphorae			
Tripolitanian	1,424	39.9%	115.1	27.6%	102	22.6	78
Punic African	61	1.7%	7.3	1.7%	22	2.7	15
Brindisi	834	23.4%	97.4	23.3%	72	22.9	69
Adriatic	617	17.3%	174.7	34.7%	66	16.7	38
Rhodian	326	9.1%	29.6	7.1%	20	3.9	18

of this site. The excavation by Archeodunum (directed by Peter Jud), which ran from 2009 until 2011, uncovered an area of *c* 2.6 ha. The excavation found dense occupation with *c* 70 wells, various industrial activities including the working of bronze, gold, iron and lead (primarily from zones 2 and 4), open areas and domestic occupation (as indicated by the presence of timber constructions, loom weights, storage vessels, etc.) in the western part of the excavation (zones 7, 11 and 12) (Jud *et al* 2012) (Fig 2). In some parts of the excavation the Late Iron Age occupation had been heavily disturbed (zones 8 and 10) or lost altogether (parts of zones 6 and 12) (Fig 2). The finds are consistent with a second century BC date and include La Tène II and Nauheim brooches, monnaies à la croix, potins, Italian Campanian A and rare Campanian B pottery (Jud *et al* 2012). For the Republican amphorae the absence of the Dressel 1B and the rarity of transitional Dressel 1A/Bs and Dressel 1Cs suggest that the site was abandoned by the end of the second century BC (Loughton and Alberghi 2012).

4. Amphorae from the 'caserne Niel'

The excavation has produced one of the largest amphora assemblages from a rescue excavation in France with approximately 880,000 sherds with a weight of *c* 98 metric tons (Loughton and Alberghi 2012) (Table 1). Large numbers of amphorae are found dumped in pits and wells, in some areas of the site amphora sherds and river pebbles were used to create pavements and surfaces, while in zone 4 many complete Dressel 1s were laid out side by side. The majority of amphora sherds belong to western Italian Republican vessels (Greco-Italic and Dressel 1A) while sherds of other 'exotic' amphorae are relatively rare (Table 1). Exotic amphorae include vessels from Tripolitania, Tunisia, Brindisi, Adriatic Italy, Rhodes and various rarer types (including Baetican, Tarraconensian and Punic from Spain). Using

the rim EVE figures exotic amphorae only represent 1.3% of the total number of vessels (Table 1), though it might be recalled that whilst EVEs provide the most reliable technique for estimating the number of vessels, a drawback is that they provide a 'minimum figure' and will underestimate types not represented by rim sherds; furthermore, they are rarely employed in French pottery/amphora reports. In contrast the rim EVREP (estimated vessel representation) values provide a 'maximum figure' for the number of amphorae.

5. Tripolitanian amphorae from the 'caserne Niel'

5.1 Quantitative information

The assemblage contains 1,424 sherds from Tripolitanian amphorae with a weight of 115 kg (Table 1). The mean sherd weight is low at 81g and this reflects the thin construction of these vessels. Comparing and refitting the 102 rim fragments gives a rim EVREP of 78 while the rim EVE is 22.6 (0.4% of the total number of amphorae). There were also 98 handles, 31 shoulders and 39 bases.

Although at first sight the assemblage of Tripolitanian amphorae appears to be numerically unimportant accounting for only 0.2% of the total number of amphora sherds and 0.1% by weight, they are surprisingly the most frequent exotic amphora (by sherd count, rim count, and EVREP) from the excavation (Table 1). With a minimum of 78 vessels this is also the largest assemblage of AT amphorae from a site in France, Italy or Spain (see discussion below). Furthermore, taking into account previous excavations at Toulouse and the nearby *oppidum* of Vieille-Toulouse a total of *c* 100 vessels have been recovered from these two Late Iron Age sites.

5.2 Chronology

One of the remarkable features of the assemblage of AT amphorae from the 'caserne Niel' is the early arrival of

some examples. The earliest Iron Age features on the site with assemblages of classic Greco-Italic amphorae dating to *c* 180/170–160 BC lack any AT amphorae. However, there is one possible exception the pit FS12015 (zone 12) with two vessels, although both came from the uppermost fill of this feature and could be intrusive. Otherwise, the first AT amphorae are found in features (such as pit FS2105, well PT6155, well PT6173) which contain assemblages of classic and late Greco-Italic amphorae (Table 4). The well PT6155 provides further dating evidence as it also contained a Rhodian amphora with a fabricant stamp of Ἀριστοκλῆς II and a secondary stamp of B, dating to *c* 172/170–146 BC (Finkielsztejn 2001, 114, 119, 192–5 tables 19–21). The presence of late Greco-Italic amphorae, the absence of the Dressel 1A and the Rhodian amphora stamp suggest that the first Tripolitanian amphorae were arriving on the site during *c* 170/160–140 BC. Several features with assemblages of late Greco-Italics and Dressel 1As (well PT2196, basin BSN2288, well PT7056) dating to *c* 140–130 BC also contain AT amphorae. Examples continue to be found in the latest features from the site dating to the end of the second century BC (ditch FO4207, well PT6036). The AT amphorae from Toulouse ‘Saint-Roch’ pit FS.61 were deposited alongside two Dressel 1As with consular marks of 122 BC (Benquet and Grizeaud 2009, 656–9).

5.3 Typology

The majority of rims are short, with heights ranging from 2.0 to 3.0 cm, with a triangular profile while the diameters range from 11.0 to 14.5 cm (median of 13.0 cm) (Figs 3–7). These rims are similar to many of the examples known from Spain (Pascual Berlanga and Ribera Lacomba 2002) and Lattes in southern France (Py *et al* 2001, 256 nos 1336–46: rim type TrA-bd2).

There are, however, a small number of more unusual shaped examples, which are worth noting. Firstly, there are two slightly taller rims (3.0 and 3.4 cm) with an almond shaped profile from the ditch FO2140 (Fig 3 no 8) and well PT6173 (Fig 5 no 5); a similar example is known from Aix-en-Provence ‘Entremont’ (Pascual Berlanga and Ribera Lacomba 2002, 307 fig 3). Secondly, there are several taller (3.5–3.9 cm) and thicker rims from the ditch FO1071 (Fig 3 no 1), pit FS1653 (Fig 3 no 2), well PT6240 (Fig 5 no 13), pit FS8139 (Fig 6 no 9), and ditch FO12544 (Fig 7 no 9) which are similar to those from the later Tripolitanian I. Three of these examples (PT6240, FS8139, FO12544) are from secure second century BC contexts and therefore cannot belong to the later Tripolitanian I and similar rims have been found in Late Iron Age contexts at Lattes (rim types TrA-bd 1 and TrA-bd 3) (Py *et al* 2001, 253–6 nos 1325–7, 1328–35). It has been suggested that these taller and narrow rims are typical of the earliest AT amphorae (Py *et al* 2001, 253, rim type TrA-bd 1). For example, there is an example, dating to 140–120 BC, from Montredon-des-Corbières

Table 2. Number and weight of Ancient Tripolitanian amphora sherds from the excavation zones

Zone	No.	%	Weight (kg)	%
Zone 1	23	1.6%	1.190	1.0%
Zone 2	235	16.5%	23.395	20.3%
Zone 3	102	7.2%	8.040	7.0%
Zone 4	177	12.4%	12.850	11.2%
Zone 5	4	0.3%	0.355	0.3%
Zone 6	147	10.3%	24.025	20.9%
Zone 7	68	4.8%	14.275	12.4%
Zone 8	41	2.9%	2.305	2.0%
Zone 9	0	0.0%	0	0.0%
Zone 10	0	0.0%	0	0.0%
Zone 11	11	0.8%	0.300	0.3%
Zone 12	611	42.9%	28.130	24.4%
Zone 13	5	0.4%	0.239	0.2%
Totals	1,424		115.104	

‘Sainte-Croix’ (Sanchez 2009, 40, 45 fig 14 no 27). However, many of the earliest AT amphora rims from the ‘caserne Niel’, such as from the pit FS2105 (Fig 3 no 10) and well PT6155 (Fig 5 no 4) are of the classic short triangular variety. The rim from the pit FS1653 (Fig 3 no 2) could be a Tripolitanian I as this comes from a later feature. It is also worth noting the morphological variation of rims found within some features, which were presumably contemporary. Compare for example the rims from the well PT6240 (Fig 5 nos 12–14) and ditch FO2140 (Fig 3 nos 8–9). In contrast, the bases show little morphological variation.

5.4 Spatial distribution

AT amphora sherds are found in features throughout the excavation including in the zones with evidence for habitation (zones 6, 7, 11 and 12) and industrial activities (zones 2, 4, 6) (Tables 2–3). However, zone 12 with 43% of the number of sherds and 24% of the weight contains the largest assemblage of AT amphora (Table 2). Features with AT amphorae include several of the artisanal pits from zone 2 and many of the deep wells from the domestic areas of the site. Sherds were also reused to create various amphora pavements and layers, which are found throughout the excavation. In contrast, the North African Punic amphora (61 sherds) are generally confined to the industrial areas (zones 2 and 4), while there is only one vessel from the habitation area in zone 12.

5.5 Frequency

Although AT amphorae are found in a large number and variety of features (Table 3), they typically account for less than 1% of the number and weight of amphora from each feature. There are a small number of features, such



Fig 2. Plan of the 'caserne Niel' site

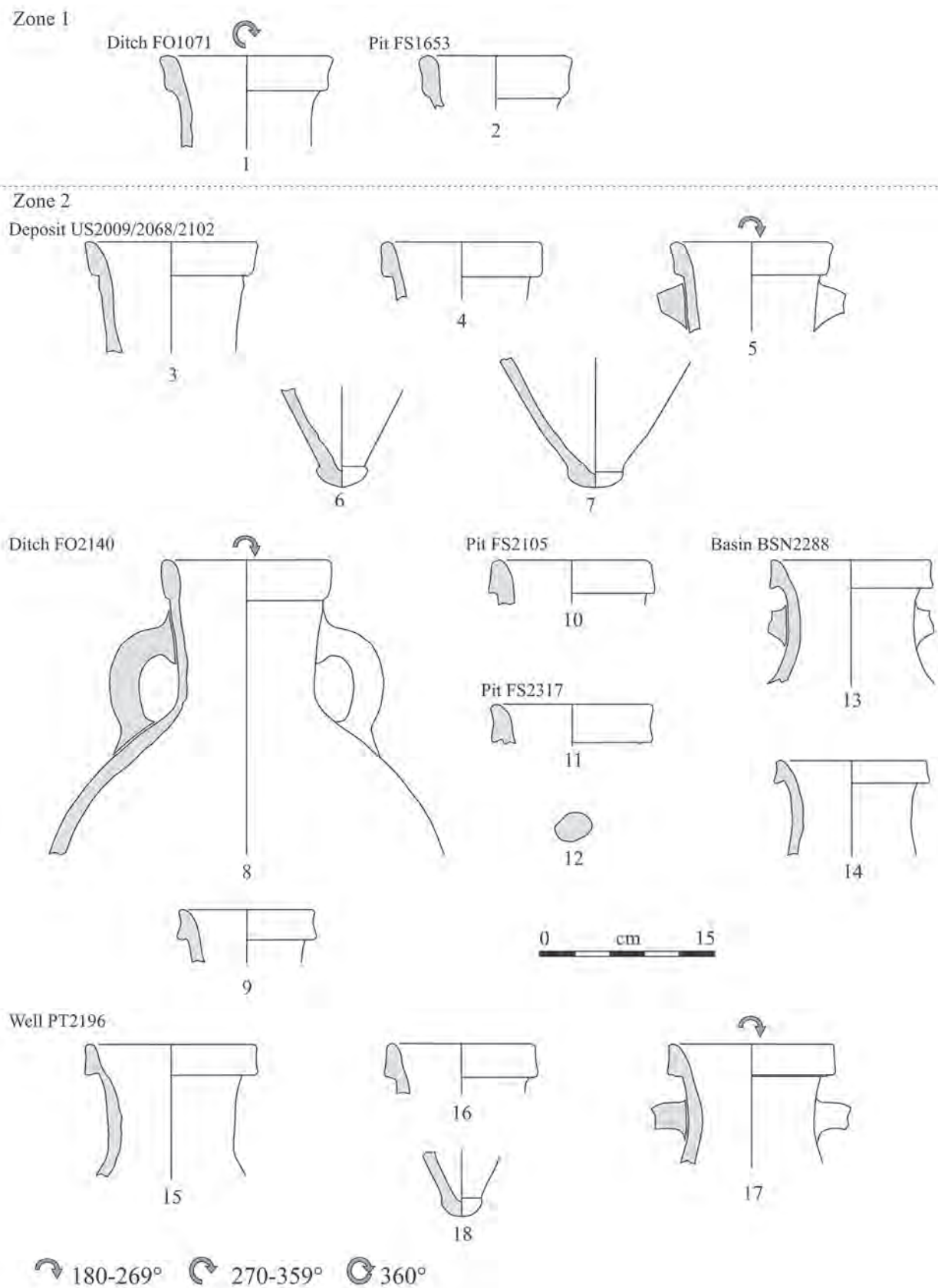


Fig 3. Form diagnostic sherds of the Ancient Tripolitanian amphora type at the 'caserne Niel' site from Zones 1-2

Table 3. Number, weight and mean sherd weight of Ancient Tripolitanian amphorae from a selection of features from the 'caserne Niel'

Feature	No.	%	Weight (kg)	%	MSW
Ditch FO1113	4	0.06%	0.205	0.02%	51
Pit FS2105	5	0.14%	0.315	0.08%	63
Pit FS2171	3	0.38%	0.085	0.09%	28
Ditch FO2140	48	1.10%	7.335	1.11%	153
Well PT2196	32	0.41%	5.685	0.38%	178
Pit FS2257	3	0.22%	0.105	0.06%	35
Pit FS2286	1	0.08%	0.025	0.02%	25
Basin BSN2288	14	0.31%	12.450	1.49%	889
Pit FS2289	3	0.21%	0.105	0.06%	35
Deposit/dump Zone 2	103	0.38%	7.335	0.33%	71
Well PT3634	1	0.03%	0.435	0.10%	435
Amphora pavement Zone 3	26	0.07%	2.000	0.07%	77
Ditch FO4207	5	0.05%	0.530	0.04%	106
Pit FS4208	1	0.24%	0.025	0.03%	25
Well PT4392	3	0.09%	0.310	0.02%	103
Pit FS4409	1	0.04%	0.050	0.01%	50
Pit FS4504	2	0.16%	0.180	0.11%	90
Pit FS4591	1	0.13%	0.225	0.23%	225
Pit FS4617	5	0.10%	0.250	0.02%	50
Well PT4938	17	0.64%	2.010	0.32%	118
Well PT6034	1	0.01%	0.080	0.01%	80
Well PT6036	38	1.09%	11.610	1.35%	306
Well PT6155	2	0.08%	0.135	0.04%	68
Well PT6173	17	0.23%	1.615	0.21%	95
Well PT6240	6	0.43%	2.265	0.46%	378
Well PT7051	2	0.06%	0.320	0.02%	160
Well PT7056	3	0.14%	0.925	0.16%	308
Ditch FO7137	2	0.10%	0.095	0.03%	48
Pit FS7250	16	2.80%	9.725	7.51%	608
Pit FS12015	2	0.04%	0.110	0.01%	55
Ditch FO12515	2	0.07%	0.130	0.06%	65
Ditch FO12544	1	0.03%	0.065	0.02%	65
Ditch FO12860	1	0.08%	0.010	0.01%	10
Well PT12128	2	0.15%	0.070	0.02%	35
Well PT12491	17	0.66%	0.485	0.23%	29
Well PT14240	66	2.75%	10.780	1.31%	163

as the ditch FO2140, well PT6036, pit FS7250 and well PT14240 (Table 3), with relatively larger assemblages of AT amphora.

For a sample of features, which were chosen for an exhaustive study, it is possible to compare the frequency of AT amphorae as against the total number of amphorae, using the rim EVREP values. As can be seen from Table 4 AT amphorae rarely account for more than 1–2% of the total number of amphorae. Occasionally, as for the

pit FS4504 and the well PT6240, they represent 3–4% of the total amphora EVREP. To summarize, AT amphorae appear to have been imported at the same low rate throughout the occupation of the site and there is no evidence for an increase in their frequency with time. This is also the pattern for the small number of other published assemblages from Toulouse 'Saint-Roch' and Vieille-Toulouse, which contain AT amphorae (Table 4).

It is possible that these percentages give a slightly

Table 4. Number and percentage of Ancient Tripolitanian amphorae from selective features from the 'caserne Niel' and from other published assemblages from Toulouse 'Saint-Roch' (Benquet and Grizeaud 2009) and Vieille-Toulouse (Benquet *et al* 2002)

Feature	Date	Rim EVREP	% of total amphora EVREP
'caserne Niel'			
Pit FS2105	c 170/160–140 BC	1	1%
Ditch FO2140	c 140–130 BC	2	2%
Well PT2196	c 140–130 BC	3	1%
Basin BSN2288	c 140–130 BC	2	1%
Ditch FO4207	c 130–100 BC	1	0.5%
Pit FS4504	c 130–100 BC	1	3%
Well PT6036	c 130–100 BC	1	1.5%
Well PT6155	c 170/160–140 BC	1	2%
Well PT6173	c 170/160–140 BC	1	0.5%
Well PT6240	c 130–100 BC	3	4%
Well PT7056	c 140–130 BC	1	1%
Ditch FO7137	c 140–130 BC	1	1%
Pit FS12015	c 180/170–160 BC?	2	2%
Ditch FO12515	c 170/160–140 BC	1	0.5%
Ditch FO12544	c 140–130 BC	1	1%
Well PT12128	c 130–100 BC	1	2%
Well PT14240	c 140–130 BC	2	2%
'Saint-Roch'			
Pit FS.61	Late 2nd c. BC	4	6%
Well PT.73	Late 2nd c. BC	3	4%
Vieille-Toulouse			
Well 16	50–25 BC	1	3%
Well 37	45–1 BC	2	2%

misleading impression of the relative frequency of AT amphorae (and other exotic amphorae) at the 'caserne Niel'. This is because of the enormous numbers of western Italian Republican amphorae known from the site. The volume of Italian wine being imported here is too great to be explained by on-site consumption or even the holding of great feasts. The presence of large dumps of homogenous and intact Greco-Italic amphorae (including many examples marked with the same painted inscriptions), in wells and pits suggests that the contents of many Republican amphorae were transferred into other containers for redistribution (Loughton and Alberghi 2012). There is also evidence for the recycling, reuse and rebottling of Republican amphorae on site and it is possible that some old Republican amphorae were imported to the site for these purposes. In contrast, the contents of the exotic amphorae were most likely consumed on site while a significant proportion of the Republican amphorae were not. Taking this into account would suggest that the relative frequency of AT amphorae on the site was greater than the raw figures indicate. It is also worth noting that the capacity of the AT amphora was equal to two or three Dressel 1As.

It is worth noting here too the rarity of Punic North African amphorae (EVREP 15) from the 'caserne Niel' and this is a feature of other Late Iron Age amphora assemblages from Toulouse and Vieille-Toulouse (Benquet *et al* 2002; Benquet 2002).

5.6 Fabrics and Provenance

The rim fragments can be divided into four fabrics based on a visual analysis and the use of a hand lens. The majority of rims (54 vessels, 69%) are in a distinctive fine, hard, pinkish coloured fabric with frequent inclusions of quartz and white limestone, and a thick white surface. This fabric can clearly be identified with the Tripolitanian fine fabric (Peacock 1984, 18; Williams and Carreras 1995, 244; Bonifay 2005) which has been linked with the kilns at *Zitha* in eastern Tunisia (Bonifay 2004, 29; Bonifay *et al* 2010, 325–6) although the fabrics of amphorae produced in the nearby kilns at Gallala on the island of Jerba can be similar (Bonifay 2004, 29). Many of the AT amphorae from Spain (Pascual Berlanga and Ribera Lacomba 2002, 305; Molina Vidal 2007, 210), Lattes (Py *et al* 2001, 253) and vessels uncovered at Toulouse 'Saint-Roch' (Benquet and Grizeaud 2009,

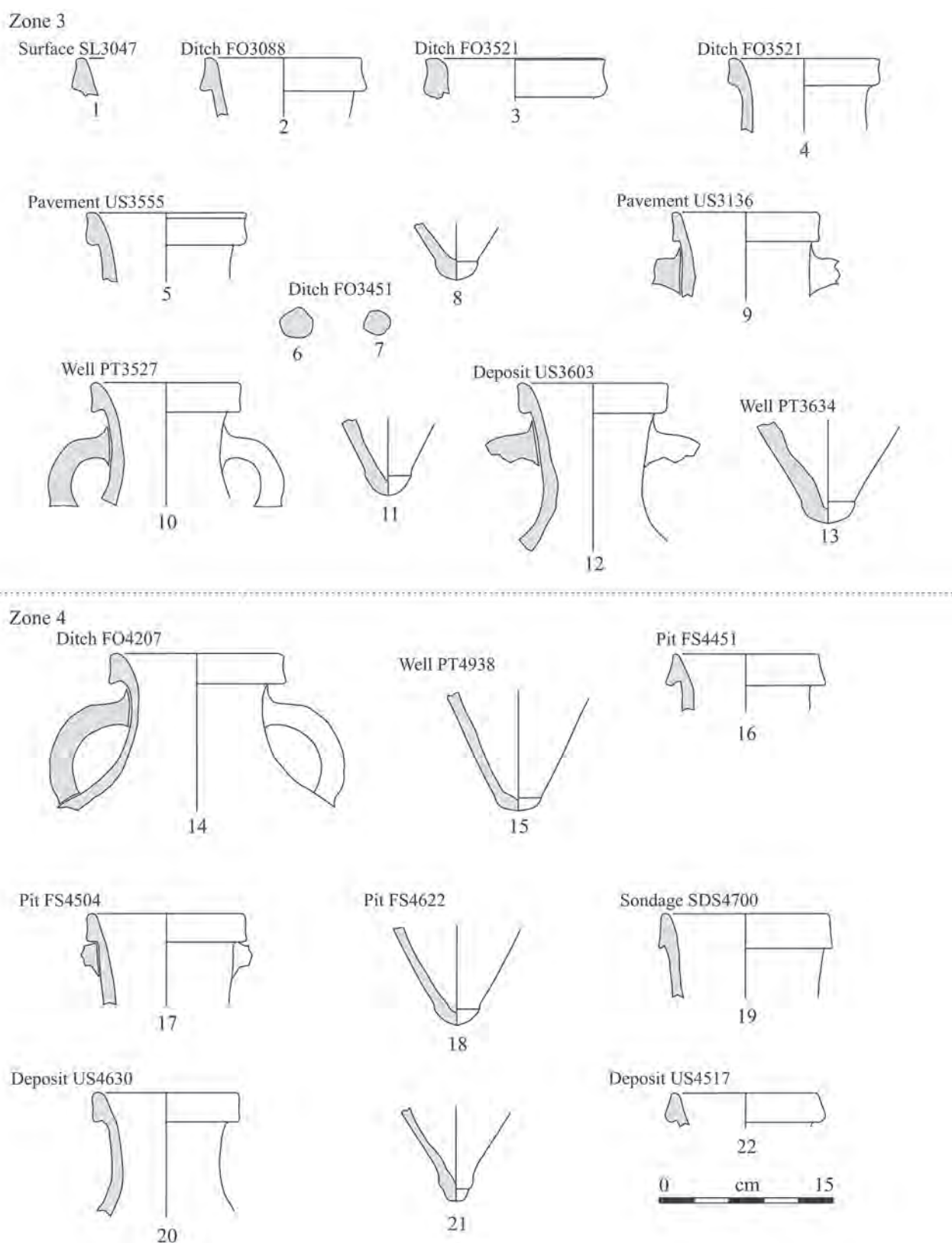


Fig 4. Form diagnostic sherds of the Ancient Tripolitanian amphora type at the 'caserne Niel' site from Zones 3–4

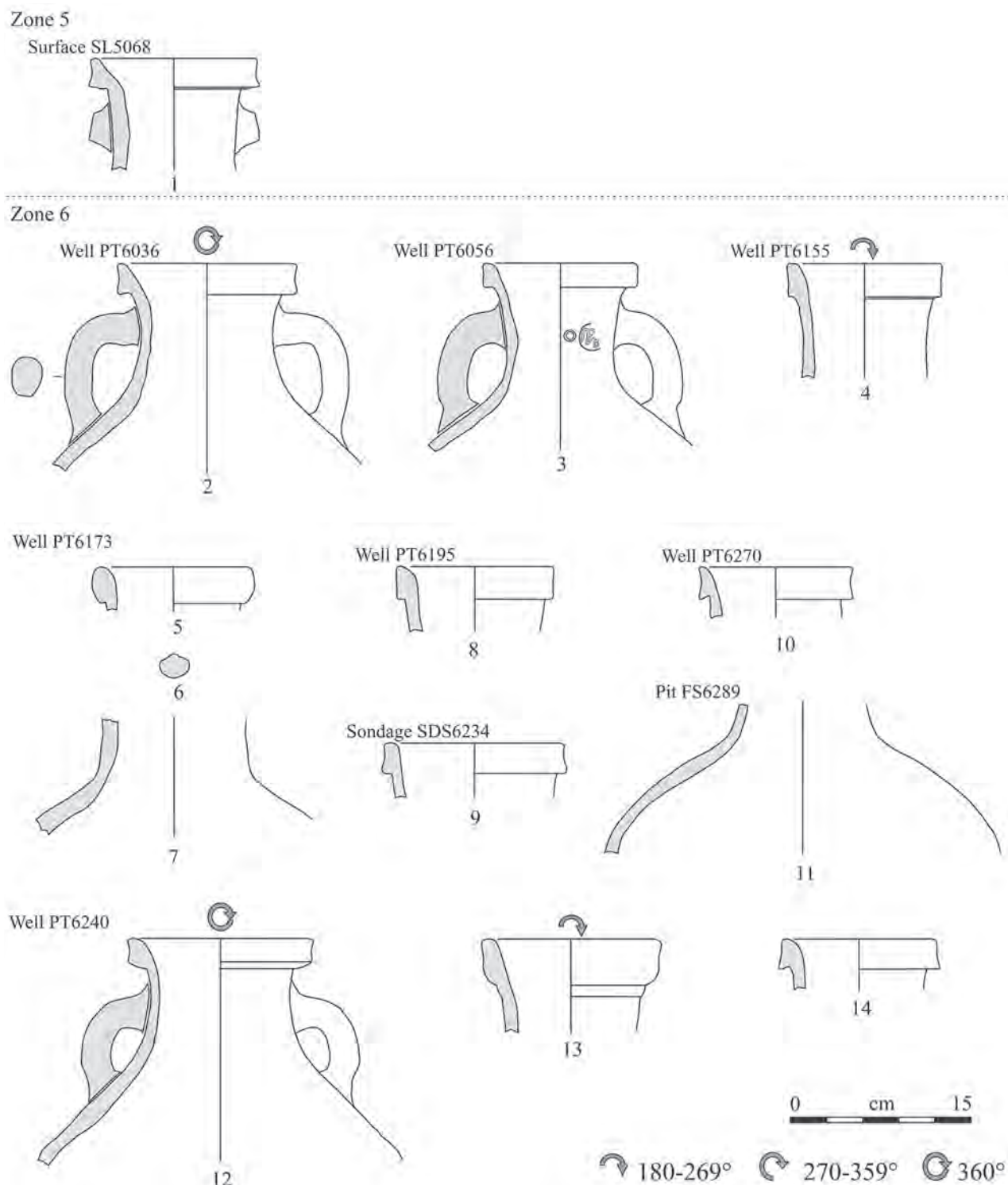


Fig 5. Form diagnostic sherds of the Ancient Tripolitanian amphora type at the 'caserne Niel' site from Zones 5–6

659) appear to be in a similar fabric. Nonetheless, as mentioned earlier, AT amphorae are not known from any of the kilns at *Zitha*.

Seven vessels (10%) are found in a coarser rough fabric, which is brick-red to brown coloured, sometimes with a grey core and surface. There are frequent inclusion

of limestone, as well as some quartz and yellow/white streaks and nodules. This fabric resembles the Tripolitanian coarser fabric from the region of *Lepcis Magna* (Peacock 1984, 18; Williams and Carreras 1995, 244; Bonifay 2005). One of the AT rims from Lattes appears to be in this same fabric (Py *et al* 2001, 253–4 no 1327).

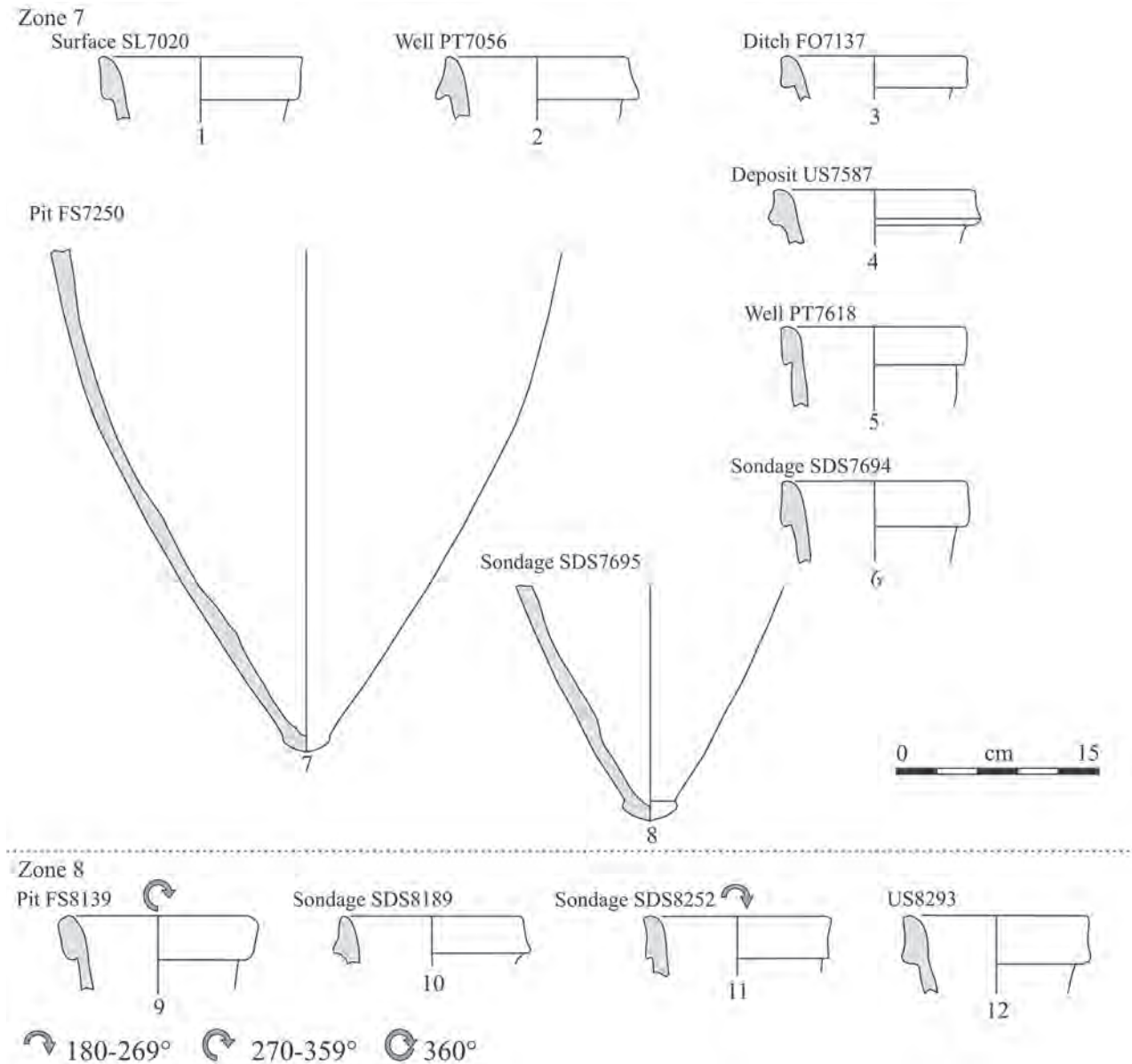


Fig. 6. Form diagnostic sherds of the Ancient Tripolitanian amphora type at the 'caserne Niel' site from Zones 7–8

Three vessels are found in a greenish to white coloured fabric with inclusions of fine quartz and limestone. This fabric appears to be similar to local ceramics and amphorae manufactured at Benghazi 'Euesperides', Libya (Göransson 2004, 139) although such an origin seems unlikely. Alternatively, the colour of these vessels could be the result of over-firing.

Finally, the remaining vessels are found in various fine, hard pink coloured fabrics often with a yellow coloured surface. Few inclusions are visible except for some quartz and rare limestone.

It is worth mentioning that the fabrics of the AT amphorae from the 'caserne Niel' differ from those belonging to the small number of North African Punic vessels (Maña C1b, C1/2 and C2a), from the excavation.

The fabrics of the Punic vessels are broadly similar with a thin yellow or grey surface, a deeper red coloured fabric with frequent inclusions of limestone and small voids with reaction rims. Some of the fabrics are similar to those of amphorae from Salakta (*Sullectum*) in Tunisia.

5.7 Stamps

AT amphorae are occasionally stamped on the rim or upper neck (Pascual Berlanga and Ribera Lacombe 2002, 313 fig 9) (Table 5). There was one example from the excavation: a circular triple-letter stamp of LAB or LAR placed on the neck with an impressed circle next to it (Fig 8). Similar impressed circles are found stamped on several vessels from Spain as well as an example from Lattes in southern France (Table 5). Triple-letter stamps

Zone 12

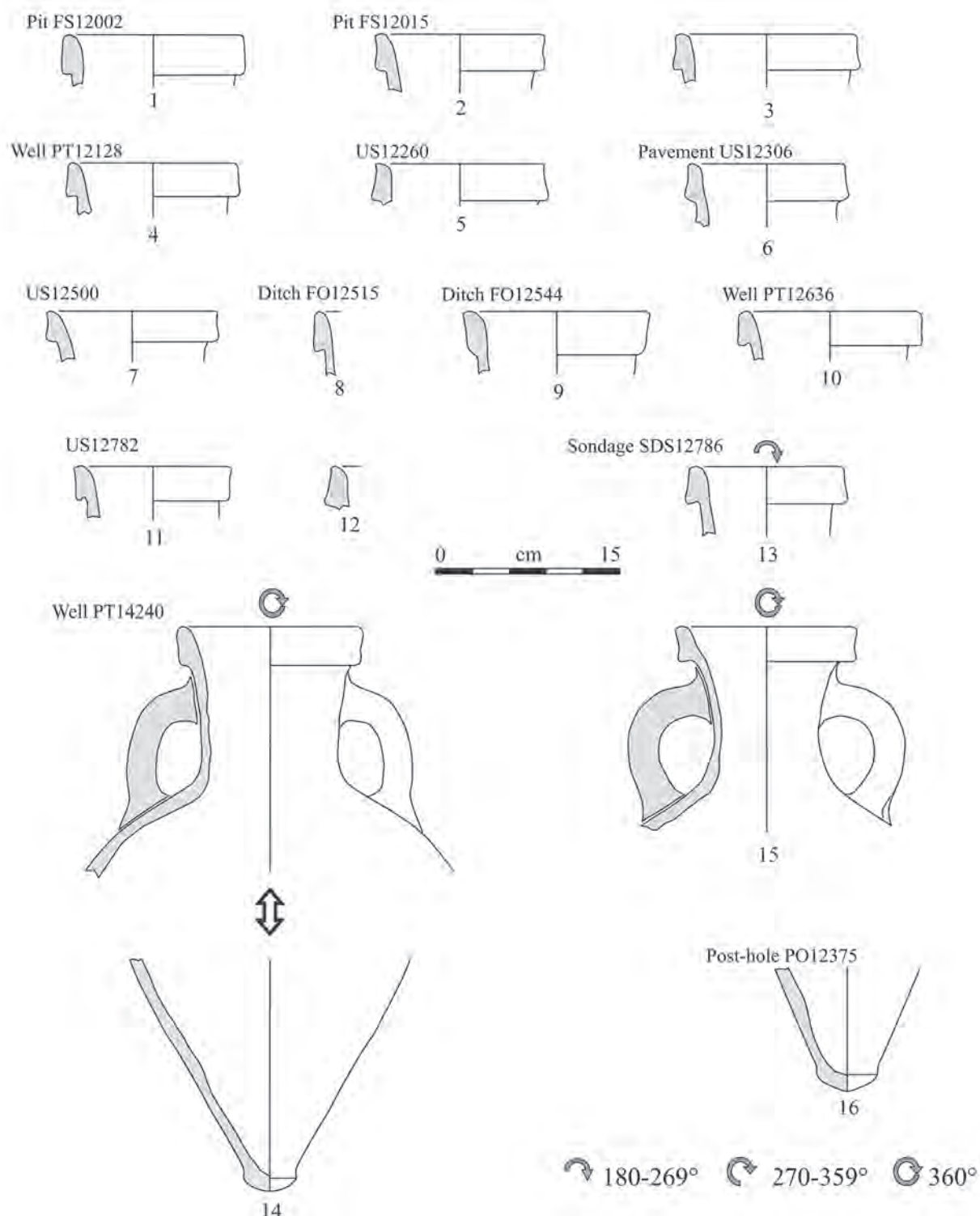


Fig 7. Form diagnostic sherds of the Ancient Tripolitanian amphora type at the 'caserne Niel' site from Zone 12

are found on a small number of AT amphorae from France and Spain (Table 5) and they most likely represent the *tria nomina* of individuals involved in the production of Tripolitanian amphorae and/or the commodities carried within them. *Tria nomina* stamps are found on later

Tripolitanian amphorae and especially the Tripolitanian III (Manacorda 1983; Mattingly 1998b, 32–5).

5.8 Resin Linings

None of the AT amphora sherds preserved any visible

Table 5. Ancient Tripolitanian amphora stamps (* identification is not certain as the same stamp is found on some Tunisian Punic Maña C2 vessels)

Country and Site	Placement	Stamp	Reference
Egypt			
Alexandria	Neck	<u>ATI</u>	Bonifay 2004, 101
France			
Lattes	Neck	<u>ATI</u> ?	Py <i>et al</i> 2001, 256-7
Lattes	Neck	Circle	Py <i>et al</i> 2001, 256-7
Narbonne 'La Médiathèque'	Neck	JB	Sanchez 2009, 149 fig 107 no 14
Nîmes 'source de la Fontaine'	Neck?	<u>HE</u> [L?]	Guillet <i>et al</i> 1992, 76 fig 27
Toulouse 'caserne Niel'	Neck	LAB or LAR?//Circle	Benquet and Grizeaud 2009, 659
Toulouse 'Saint-Roch'	Neck	Fish?	
Vieille-Toulouse	Neck	Palm or diamond?	Benquet 2002
Spain			
Almería 'Villaricos'*	Neck	ΜΑΓΩΝ	Aranegui Gascó 2002, 410 fig 1
Burriac	Neck	Star	Pascual Berlanga and Ribera Lacomba 2002, 313 fig 9
Burriac	Rim	<u>NTD</u>	Pascual Berlanga and Ribera Lacomba 2002, 313 fig 9
Denia*	Neck	ΜΑΓΩΝ	Aranegui Gascó 2002, 411 fig 3
Torre Roja	Neck	Circle	Pascual Berlanga and Ribera Lacomba 2002, 313 fig 9
Site not specified	Neck	Circle	Pascual Berlanga and Ribera Lacomba 2002, 313 fig 9
Site not specified	Neck	Diamond	Pascual Berlanga and Ribera Lacomba 2002, 313 fig 9



Fig. 8. A circular triple-letter stamp of LAB or LAR with adjacent impressed circle on the neck of an Ancient Tripolitanian amphora from the 'caserne Niel' site

resin linings on their inner surfaces while in contrast one Tunisian Punic amphora base did so. Although it is possible that the resin linings were simply not preserved, this seems highly unlikely given that many sherds were recovered from features that contained Republican

amphora sherds with resin linings. Similarly, the AT amphorae from Ostia 'La Longarina', Italy (Hesnard 1980, 150), the Cap Camarat (Liou and Pomey 1985, 569) and Jaumegarde B wrecks (Parker 1992, 222) were also not resin lined. Later Imperial Tripolitanian

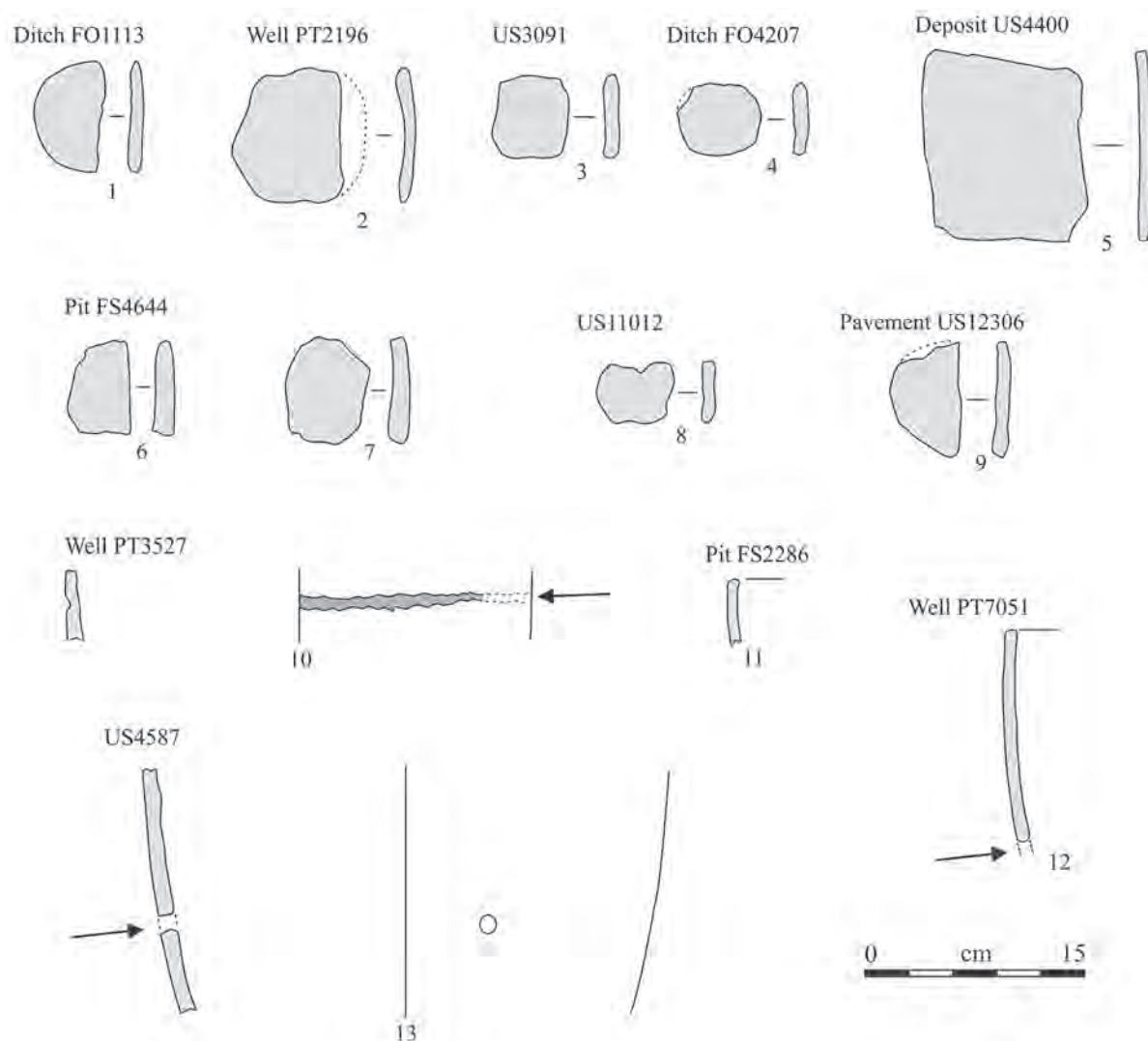


Fig 9. Examples of reuse, modification and piercing of Ancient Tripolitanian amphora from the 'caserne Niel' site: Nos 1–9 trimmed sherds fashioned as discs or similar; Nos 10–13 sawn and truncated vessels; Nos 12–13 with small pierced holes

amphorae were also not resin lined (Marty and Zaaraoui 2009, 409). The absence of resin linings is typically taken as indicating vessels that contained olive oil (although to complicate matters somewhat, content and chemical analysis is showing that many olive oil amphorae, including Dressel 20s and various African vessels, were resin lined (Garnier *et al* 2011)). This might explain the relatively greater numbers of AT amphorae recovered from the domestic areas (zones 6, 7, 11, 12) of the site and the use of their contents to provide lighting and for cooking. It is worth noting that the second most frequent exotic amphorae from the excavation is the southern Italian Brindisi amphorae (Table 1) which is also believed to have been an olive oil container. The AT amphora from the settlement of Gondole 'Les Chaumes' in central France was recovered from a pit which contained three tandoori type clay ovens (Loughton in prep.). Presumably, the olive oil could have been used in the baking of bread

or even the preparation and grilling of meats in the ovens, or during the consumption of these items.

5.9 Reuse and modification

A small number of Tripolitanian amphora sherds provide evidence for modification and reuse (Fig 9). Eight disc-shaped items fashioned from sherds of the type were recovered during the excavations, these having diameters ranging from 5.5 to 10.0 cm. The majority of examples are irregular in shape (some are incomplete) although there was one regular disc-shaped example with a smoothed margin (Fig 9 no 1, Fig. 10). There was also one large rectangular 'worked sherd' with dimensions of 11.2 by 13.1 cm (Fig 9 no 5). For comparison, there are approximately 1,980 amphora discs manufactured out of Republican amphora sherds. Discs made out of ceramic and amphora sherds are found throughout the Roman world, for example the large numbers recovered from



Fig 10. A carefully trimmed sherd fashioned as a disc-shaped item (Fig 9 no 1) from the ditch FO1113 at 'caserne Niel' that may have arrived on the site as a stopper in an Ancient Tripolitanian amphora

the Palatine Hill at Rome and at Carthage (Peña 2007, 154–8). They are also common on Late Iron Age sites in France especially sanctuaries and industrial sites. It has been suggested that they served as stoppers for amphora or ceramic vessels, gaming pieces, tokens, weights (if perforated), labels and so forth (Peña 2007, 158–64). It is possible that the carefully worked and disc-shaped example from the ditch FO1113 (Fig 9 no 1, Fig 10) may have arrived on the site as a stopper in a Tripolitanian amphora as discs were often employed to seal African amphorae (Peña 2007, 153–5).

There is also evidence for the modification of AT amphorae so that they could be reused on site as storage vessels. Two vessels had had their upper portions removed and the breaks smoothed and polished (Fig 9 nos 11–12). One of these vessels is also pierced with a small hole (*c.* 1.0 cm) approximately 14 cm below the modified upper margin (Fig 9 no 12). There is a second vessel pierced with a small hole (*c.* 1.0 cm) towards the lower body (Fig 9 no 13). Olive and wine amphorae on sites in North Africa, Italy and the eastern Mediterranean were sometimes opened by being pierced (Bonifay 2004, 467–9; Peña 2007, 66–9; Slane 2011, 98). At the necropolis of *Pupput*, Tunisia, various North African amphorae were pierced with several small holes (diameter 1–2 cm) on the middle to lower body (Bonifay 2004, 467–9 fig 264). However, this technique was rarely employed to open and decant amphorae found on sites in Late Iron Age Gaul.

Finally, there was one upper body sherd with a long narrow linear cut, or saw mark, perhaps resulting from

an unsuccessful attempt to remove the lower portion of the amphora so it could be reused as a storage vessel (Fig 9 no 10). In comparison, approximately 100 Republican amphorae had been modified to be reused as storage vessels.

6. Discussion and Comparison with the rest of France and Mediterranean Europe Distribution

Broadly speaking the majority of French AT amphora find-spots are from sites along the Mediterranean coast and they are particularly frequent around Marseille, the lower Rhône valley and Narbonne (Fig 11). Occasional vessels are found outside of these zones including along the course of the river Rhône as far as Lyon and in some of the major *oppida* from central (Gondole, Gergovie) and eastern France (Bibracte). For western France there is only one find-spot, coming from the open agglomeration/industrial settlement at Mouliets-et-Villemartin 'Lacoste' (Benquet and Piot 2000). Finally, find-spots have recently been reported from two settlements in north-eastern France at *Nasium* 'Cul de Breuil' (Bonaventure *et al* 2012) and Sarrewerden (Féliu and Olmer 2013). It is also worth noting that despite their frequency at Toulouse and Vieille-Toulouse they are rarely recovered from surrounding Late Iron Age sites although many of those sites have otherwise yielded large numbers of Republican amphorae and occasional vessels from Brindisi and Adriatic Italy (Benquet in Toledo Mur 2008).

7. The Chronology of the Type

The early importation of AT amphorae slightly before 150 BC at the 'caserne Niel' is supported by a small number of similar early find-spots (Table 6). Dealing with France first, there is an example from a deposit dating to *c.* 170–140 BC at Marseille 'La Bourse' (Bertucchi and Marangou 1989). In Spain there are three possible examples dating to the first half of the second century BC from Almería 'Villaricos', Calafell 'Alorda Park' and Emporion 'parking de Empúries' (Pascual Berlanga and Ribera Lacomba 2002, 308; Asensio *et al* 1998, 67; Mateo Corredor 2012, 122). At Athens, Greece, there are two possible vessels from contexts dating to the middle of the second century BC (Lawall 2006, 273, fig 2).

An appearance before 150 BC is also suggested by the finding of examples alongside Greco-Italic amphorae from the Chrétienne C (Joncheray 1975) and Jaumegarde B (Parker 1992, 222) wrecks (Table 6). The identification of the vessels from these two wrecks, however, is not certain. Finally, the possible presence of an AT amphora at Carthage (Bechtold 2010, 61, 64 fig 34 no 7) would confirm an origin before 146 BC.

Otherwise, there are many find-spots from France, Spain and Portugal dating to *c.* 150–130 BC (Table 6).

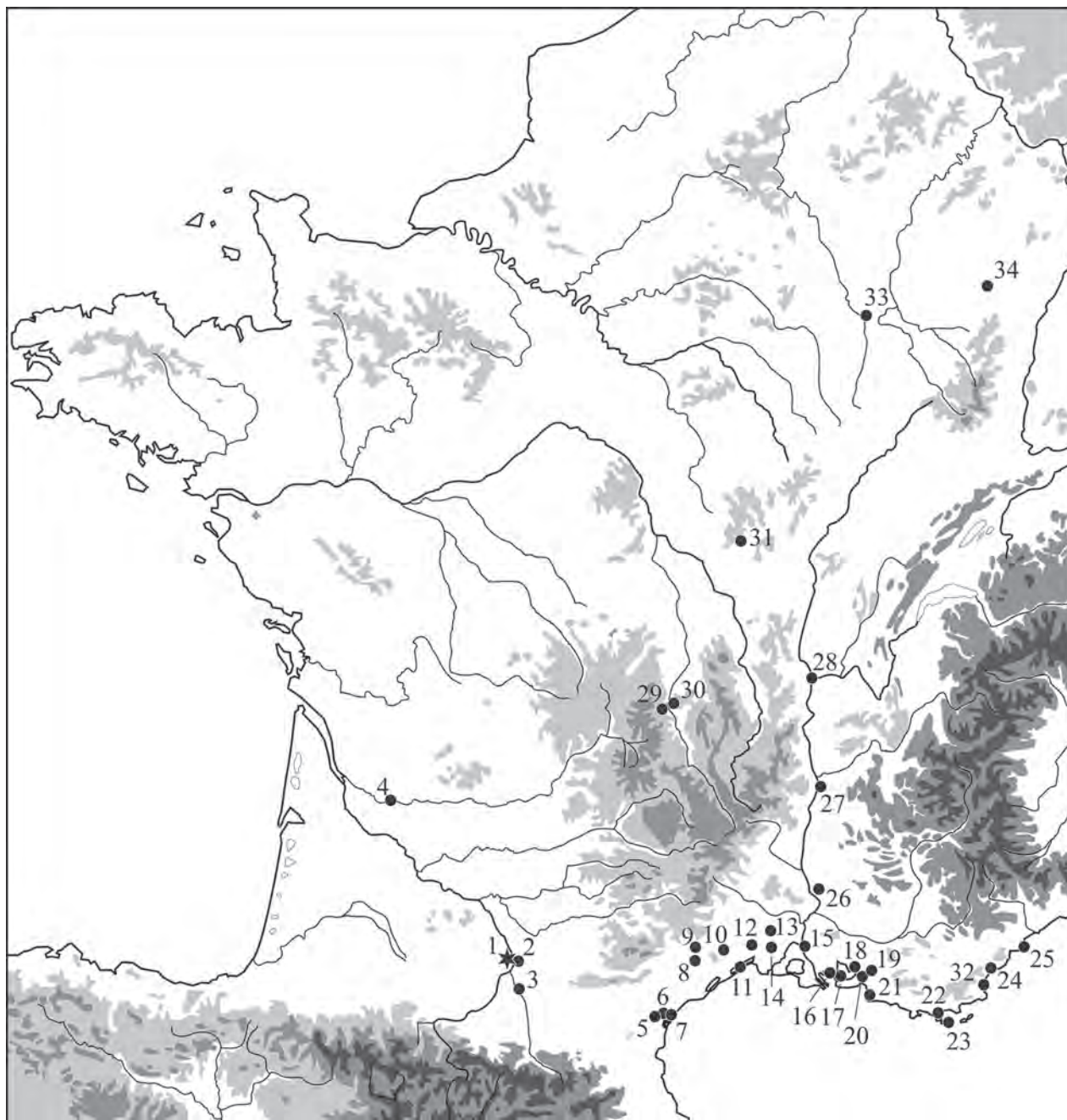


Fig 11. The distribution of Ancient Tripolitanian amphorae in France; 1: Toulouse, 2: Vieille-Toulouse, 3: Auterive, 4: Moullets-et-Villemartin 'Lacoste', 5: Montredon-des-Corbières 'Sainte-Croix', 6: Narbonne 'Avenue Anatole-France', 'La Médiathèque', 'l'oppidum de Montlaurès' (?), 7: Vinassan 'La Grangette/Saint-Félix', 8: Adissan, 9: Clermont-l'Hérault 'Peyre-Plantade', 10: Murviel-lès-Montpellier 'Castellas' (?), 11: Lattes, 12: Villetelle 'Ambrussum', 13: Nîmes 'Carsalade', 'Jean-Jaurès' (?), 'Maison Carrée' (?), 'source de la Fontaine', 14: Le Cailar, 15: Arles 'Grand-Parc', 16: Fos-sur-Mer, 17: Martigues, 18: Rognac, 19: Aix-en-Provence 'Entremont', 20: Les Pennes-Mirabeau 'La Cloche', 'Teste-Nègre', 21: Marseille 'La Bourse', 22: Hyères 'Olbia', 23: Ile de Porquerolles, 24: Fréjus, 25: Antibes 'Bas Lauvert', 26: Orange 'Saint-Florent', 27: Valence 'rue d'Arménie/Bouffier' (?), 28: Lyon 'Cybèle', 29: La Roche Blanche 'Gergovie', 30: Gondole 'Les Chaumes', 31: Mont Beuvray 'Bibracte', 32: Saint-Tropez 'Platanès', 33: Nasium 'Cul de Breuil', 34: Sarrewerden

At Lattes the earliest AT amphora dates to 150–125 BC (Py *et al* 2001, 254) while at Montredon-des-Corbières 'Sainte-Croix' there is an example dating to broadly the same period (Sanchez 2009, 40, 45, fig 14 no 27).

In Spain the vessels from the Roman military camps at Numance pre-date 133 BC (Sanmartí-Gregó 1985) and there are at least five vessels from the earliest layers at Valentia (TPQ 138 BC) (Pascual Berlanga and Ribera

Table 6. Dated find-spots of Ancient Tripolitanian amphorae (*27 Dressel 26's but there are also several Ancient Tripolitanian I's; ** classified as North African Greco-Italic)

Country and Site	MNI	Date	Reference
France			
Aix-en-Provence 'Entremont'	2?	Late 2nd c. BC?	Gateau 1990, 176 fig 19 nos 21–2
Antibes 'Bas Lauvert'	1	130–110 BC	Daveau and Lang-Desvignes 2009
Arles 'Grand-Parc'	2	50–25 BC	Excoffon and Pasqualini 2004
Cap Camarat wreck	?	75–25 BC	Liou and Pomey 1985
Chrétienne C wreck	1?	175–150 BC	Joncheray 1975
Clermont-l'Hérault 'Peyre-Plantade'	1	Augustan	Rascalou 2006
Fos-sur-Mer	9	Late 2nd c.–1st c. BC	Liou and Sciallano 1989, 157
Fréjus	1	Augustan-Tiberian	Excoffon <i>et al</i> 2011, 160–1
Gondole 'Les Chaumes'	1	80–50 BC	Loughton in prep.
Hyères/Ile de Porquerolles 'La Galère'	7	100/90–40/30 BC	Brun 1991
Hyères 'Olbia'	9	40/30 BC–AD 10	Bats (ed.) 2006
	1	AD 10–30	Bats (ed.) 2006
Jaumegarde B wreck	?	200–140 BC	Parker 1992, 222
Lattes	1	150–125 BC	Py <i>et al</i> 2001, 254
	1	150–100 BC	Py <i>et al</i> 2001, 256
	4	125–100 BC	Py <i>et al</i> 2001, 254–57
	1	125–75 BC	Py <i>et al</i> 2001, 255
	2	100–75 BC	Py <i>et al</i> 2001, 255–6
	2	100–50 BC	Py <i>et al</i> 2001, 256
	1	75–50 BC	Py <i>et al</i> 2001, 256
	1	75–25 BC	Py <i>et al</i> 2001, 256
	5	50–25 BC	Py <i>et al</i> 2001, 255–7
	1	c 50 BC	Py <i>et al</i> 2001, 257
	2	25–1 BC	Py <i>et al</i> 2001, 255–6
Les Pennes-Mirabeau 'La Cloche'	?	200–50 BC	Py <i>et al</i> 2001, 254; Chabot 1996
Les Pennes-Mirabeau 'Teste-Nègre'	1	200–100 BC	Py <i>et al</i> 2001, 254
Lyon 'Cybèle'	4	40–20 BC	Lemaître <i>et al</i> 1998
Madrague de Giens wreck	1	70–50 BC	Parker 1992, 250
Marseille 'La Bourse'	1	170–140 BC	Bertucchi and Marangou 1989
Mont Beuvray 'Bibracte'	1	100–50 BC	Olmer 1998, 82
Montredon-des-Corbières 'Sainte-Croix'	1	140–120 BC	Sanchez 2009, 40, 45 fig 14 no 27
Mouliets-et-Villemartin 'Lacoste'	1	Late 2nd c. BC?	Benquet and Piot 2000
Murviel-lès-Montpellier 'Castellas'	?	Augustan	Barberan <i>et al</i> 2009, 308
Narbonne 'Avenue Anatole-France'	1	120–100 BC	Sanchez 2009, 99 fig 65
Narbonne 'La Médiathèque'	1	75–60 BC	Sanchez 2009, 124, fig 86
	1	50–40 BC	Sanchez 2009, 138, fig 98
	1	40–30 BC	Sanchez 2009, 149, fig 107
Nasium 'Cul de Breuil'	1?	c 80–20/10 BC	Bonaventure <i>et al</i> 2012
Nîmes 'Carsalade'	1	Tiberian	Barberan 2003; 2013
Nîmes 'source de la Fontaine'	2	75–50 BC	Guillet <i>et al</i> 1992
	1	40/30–20 BC	Guillet <i>et al</i> 1992
Orange 'Saint-Florent'	1	10 BC–AD 20	Roumégous 2005
Saint-Tropez 'Platanès'	1	75–50 BC	Brun 1997, 206
Sarrewerden	1	c 120/110–50 BC	Féliu and Olmer 2013

Toulouse 'caserne Niel' puits 5	1	Late 2nd c. BC	Benquet 2002
Toulouse 'Empalot' puits 1	1	Late 2nd c. BC	Benquet 2002
Toulouse 'route de Narbonne'	3	45–1 BC	Benquet 2002
Toulouse 'rue Feretra' well 14	1	Late 2nd c. BC	Benquet 2002
Valence 'rue d'Arménie/Bouffier'	1?	50–30 BC	Maza and Silvino 2011
Vieille-Toulouse pit 40	2	100–70 BC	Benquet 2002
Vieille-Toulouse cistern	1	45–1 BC	Benquet 2002
Vieille-Toulouse habitat 4	1	Late 2nd c. BC	Müller 1981
Vinassan 'La Grangette/Saint-Félix'	1	120–100 BC	Malignas and Le Roy 2011, 440 fig 20
Greece			
Athens 'Middle Stoa'	2?	c 150 BC	Lawall 2006, 273 fig 2
Italy			
Ostia 'La Longarina'*	27?	10 BC–AD 5	Hesnard 1980; 2001
Ostia 'House of the Porch'	5	50–25 BC	Boersma <i>et al</i> 1986
Punta Scaletta wreck	2	c 146–130 BC	Pascual Berlanga and Ribera Lacomba 2002
Skerki Wreck D	1	c 80–50 BC	McCann 2000, 446
Spargi wreck	1	120–100 BC	Py <i>et al</i> 2001, 254
North Africa			
Carthage**	1	200–146 BC	Bechtold 2010, 61 fig 34 no 7, 64
Carthage 'Second Amphora wall'	1	Tiberian	Freed and Moore 1996
Lixus (Morocco)	2	175–130 BC	Aranegui Gascó 2005, 111
	3	130–80 BC	Aranegui Gascó 2005, 114
Portugal			
Almodôvar 'Mesas do Castelinho'	1	100–50 BC	Mateo Corredor 2012, 124
Chões de Alompé 'Móron'	?	138–136 BC	Morais 2010, 93
Castro Marim	3	c 50–10 BC	Mateo Corredor 2012, 124
Lagos 'Monte Molião'	?	Late 2nd c. BC	Mateo Corredor 2012, 124
Lisbon 'Castel de São Jorge'	1	140–130 BC	Pimenta 2005, 39–40, 44
Tavira 'Cerro do Cavaco'	1	c 150–25 BC	Mateo Corredor 2012, 124
Spain			
Almería 'Villaricos'	1	<150 BC	Aranegui Gascó 2002; Mateo Corredor 2012, 122
Baetulo	1	10 BC–AD 10/20	Comas Solà and Padrós Martí 2008
Ca l'Arnau-Can Mateu	1	100–75 BC	García Roselló <i>et al</i> 2000, 35, 40
Cáceres el Viejo	3	<80 BC	Ulbert 1984
Cádiz 'Baelo Claudia'	1	c 130–100 BC	Mateo Corredor 2012, 123
Cádiz 'Campo del Gayro'	?	Late 2nd c. BC	Mateo Corredor 2012, 123
Calafell 'Alorda Park'	1	200–150 BC	Pascual Berlanga and Ribera Lacomba 2002, 308
Edeta	1	Late 2nd c. BC onwards	Bonet <i>et al</i> 2004
Emporion 'Empúries'/'L'Escala'	?	70–60 BC	Aquilué <i>et al</i> 2008
Emporion 'parking de Empúries'	1	200–150 BC	Pascual Berlanga and Ribera Lacomba 2002, 308
Fuenteobejuna 'La Loba'	46	<80 BC	Benquet and Olmer 2002, 319–22
Isona	1	125–50 BC	Py <i>et al</i> 2001, 254
Majorca 'Palama'	?	120–110 BC	López <i>et al</i> 2011, 460
	?	110–50 BC	López <i>et al</i> 2011, 460
Majorca 'Pollentia'	1	75–50 BC	Equip d'excavació de Pollentia 1993

Málaga 'Morro de Mezquitilla'	1	c 150–120 BC	Mateo Corredor 2012, 122
Mataró 'Burriac'	?	195–75 BC	Pascual Berlanga and Ribera Lacomba 2002, 309
	?	75–40 BC	Pascual Berlanga and Ribera Lacomba 2002, 309
Mataró 'Carrer Barcelona'	1	Augustan	Pérez Revilla 2000
Mataró 'Can Xammar'	1	100–80/70 BC	García Roselló <i>et al</i> 2000, 45
Pecio de illa Pedrosa wreck	1	140–130 BC	Pimenta 2005, 46
Na Perduda wreck	?	60–40 BC	Foerster and Pascual 1970
Numantia	2?	<133 BC	Sanmartí-Grego 1985; 1992
Saguntum	1	Late 2nd c. BC onwards	Bonet <i>et al</i> 2004
Tarifa 'La Silla del Papa'	?	175/150–20/10 BC	Moret <i>et al</i> 2008
Tarraco 'Gasômetre 32'	1	75–50 BC	Díaz García 2000, 215, 217 no 6
Tona 'Camp de les Lloses'	?	Late 2nd c. BC–early 1st c. BC	Pascual Berlanga and Ribera Lacomba 2002, 309
Tore de la Sal 'Cabanès'	1?	2nd c. BC	Oliver Foix and Gusi Jener 1998, 77, 80
Valentia 'l'Herba'	5?	138–110 BC	Pascual Berlanga and Ribera Lacomba 2002, 310–1
Valentia 'l'Almonia'	11	Late 2nd c. BC	Pascual Berlanga and Ribera Lacomba 2002, 308, 312
Valentia well 60314	1	5 BC–AD 5	Albiach <i>et al</i> 1998

Lacomba 2002, 310–1). In Portugal rare examples dating to around the same period are found at Chões de Alompé 'Móron' (Morais 2010, 93) and Lisbon 'Castel de São Jorge' (Pimenta 2005, 39–40, 44, 81).

There are many find-spots from France and Spain dating from the late second to early first century BC (Pascual Berlanga and Ribera Lacomba 2002, 308–9) and vessels are present in deposits through the course of the first century BC. Indeed, the AT amphora is relatively common in La Tène D2 (c 80–30 BC) contexts in France, Spain and Italy (Table 6). Some examples from Augustan contexts such as at Valentia (Albiach *et al* 1998) and Baetulo (Comas Solà and Padrós Martí 2008) are most likely residual, while their absence from other sites, such as Dangstetten, Germany (Ehmig 2010), could be explained by the large-scale export of Baetican olive oil in the Dressel 20 by this time.

8. Punic and Ancient Tripolitanian Amphorae

In contrast to the 'caserne Niel', many Late Iron Age sites in Languedoc and Provence contain greater numbers of North African Punic amphorae and fewer Tripolitanian vessels. At Antibes 'Bas Lauvert' a late second century BC assemblage contained 25 Punic Maña C2 vessels but only one AT amphora (Daveau and Lang-Desvignes 2009). Similarly, at Marseille 'La Bourse' deposits dating to c 200–140 BC contained nine Punic Maña C2's but only one AT amphora (Bertucchi and Marangou 1989). At Narbonne and surrounding sites, there is often a greater representation of African and Spanish Punic amphorae

(Sanchez 2009) while other sites such as Vinassan 'La Grangette/Saint-Félix' (Malignas and Le Roy 2011), contain an equal number of Punic and Tripolitanian amphorae. At Lattes the frequency of AT amphorae and later Punic amphora types (Maña C1/2 and C2) are broadly equal (Py *et al* 2001, 241–57). Similarly, at Pompeii 'Insula 2' and 'Casa de Ariadna' the number of AT amphorae represented is readily exceeded by the number of Punic Maña C1 and C2 amphorae, mostly of North African origin (Pascual Berlanga and Ribera Lacomba 2008). The strong bias towards Tripolitanian amphorae at Toulouse and the relative rarity of Punic amphorae appears to be unusual.

9. Frequency

As previously mentioned the 78 AT amphorae from the excavation is the single largest assemblage from a site in north-west Europe. The majority of sites in France (Fig 12), Spain (Fig 13), Portugal (Fig 14), and Italy (Fig 15) tend to contain a small number of vessels although there are some exceptions which are discussed below. The recent surveys of Spain indicate a total of about 94 vessels (Pascual Berlanga and Ribera Lacomba 2002, 308; Benquet and Olmer 2002, 319 ff) which is similar to the number of vessels from Toulouse and Vieille-Toulouse.

AT amphorae from sites in France tend to be found in similar relative frequencies as at the 'caserne Niel' (Table 4). At Arles 'Grand-Parc' (Excoffon and Pasqualini 2004), Clermont-l'Hérault 'Peyre-Plantade' (Rascalou 2006),

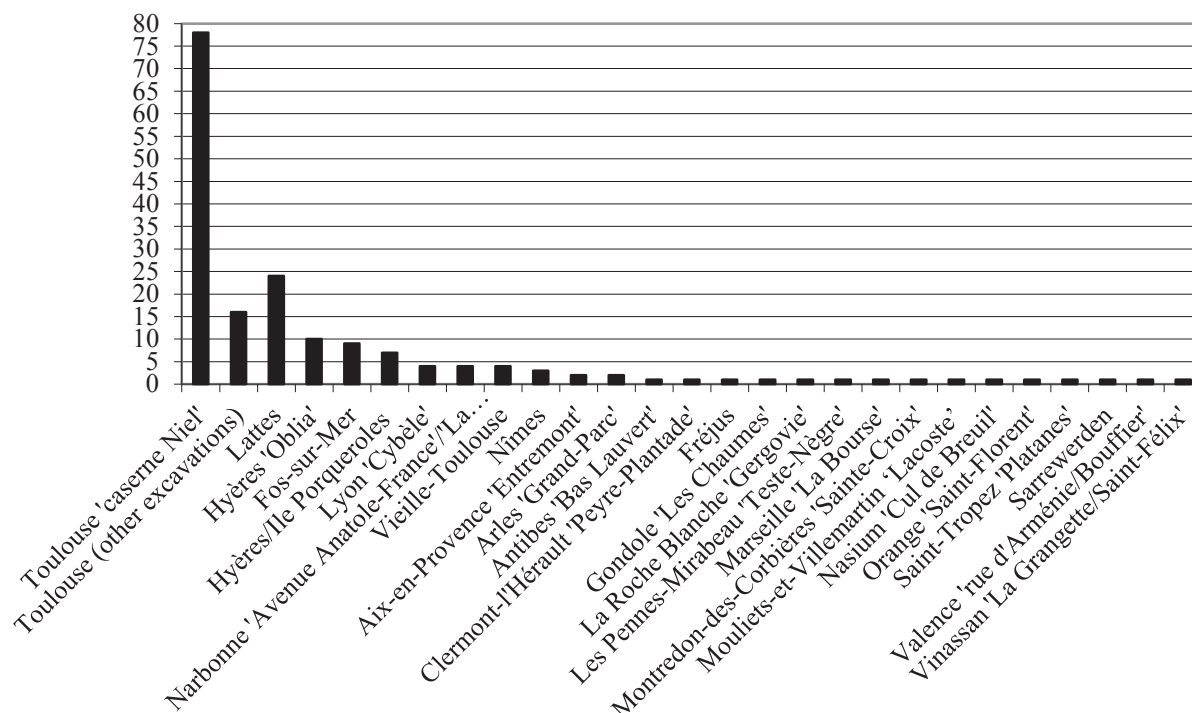


Fig 12. Sites in France with examples of Ancient Tripolitanian amphorae showing numbers of vessels represented

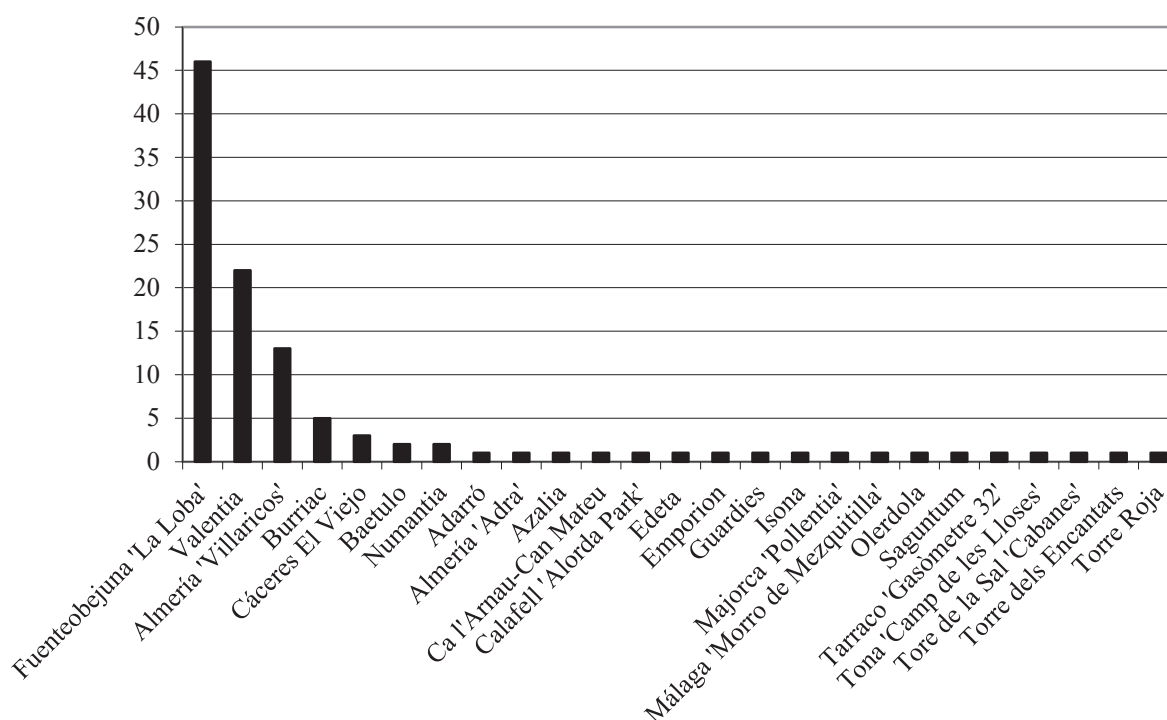


Fig 13. Sites in Spain with examples of Ancient Tripolitanian amphorae showing numbers of vessels represented

Lyon 'Cybèle' (Lemaître *et al* 1998) and Orange 'Saint-Florent' (Roumégous 2005) they account for 1–2% of the number of amphorae. A similar picture is found in Spain where AT vessels account for 2% of the total number of

amphorae from first century BC contexts (Asensio *et al* 1998, 68). At Pompeii 'Insula 2' and 'Casa de Ariadna' AT amphorae represent 3% of the total number of amphorae (Pascual Berlanga and Ribera Lacomba 2008).

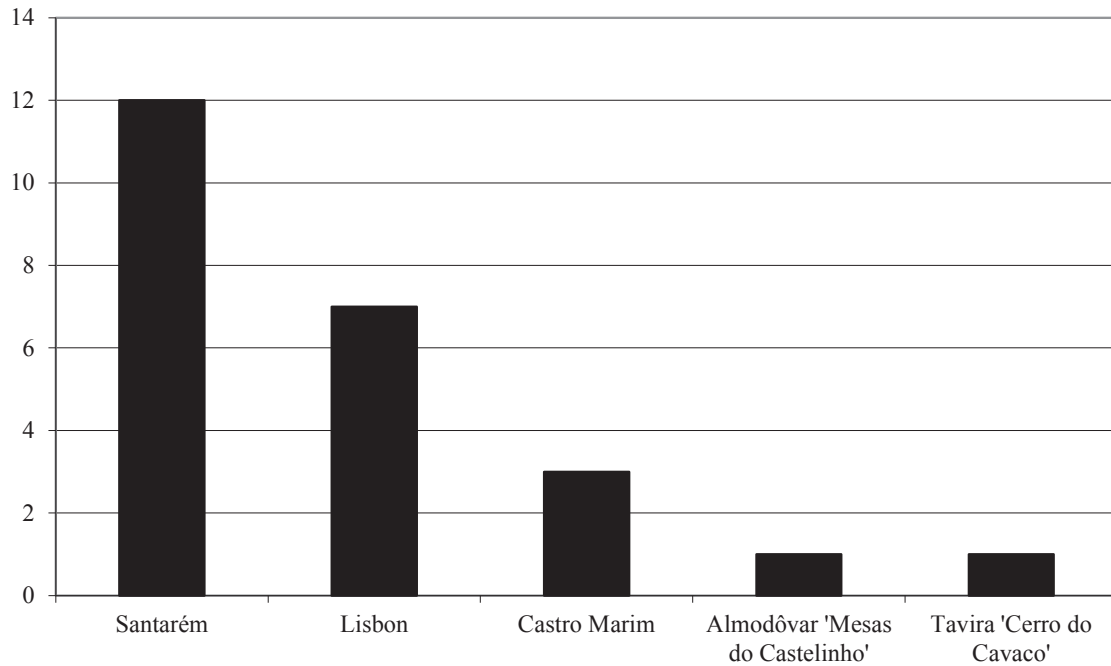


Fig 14. Sites in Portugal with examples of Ancient Tripolitanian amphorae showing numbers of vessels represented

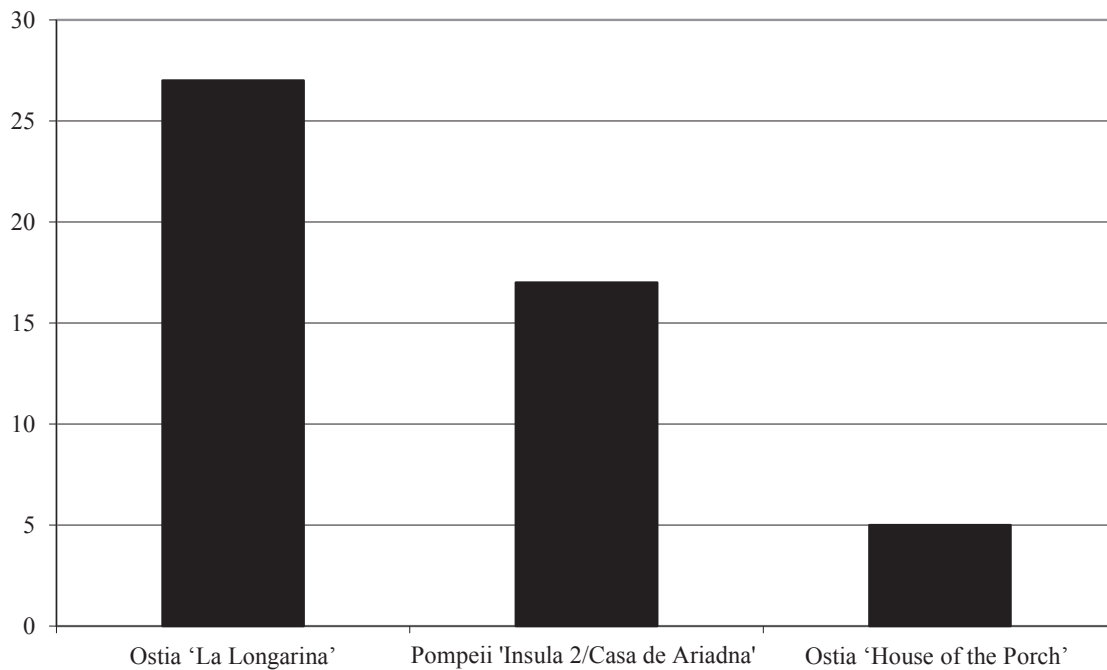


Fig. 15. Sites in Italy with examples of Ancient Tripolitanian amphorae showing numbers of vessels represented

A small number of sites, however, from Mediterranean Europe, like Toulouse, contain relatively larger assemblages of AT amphorae (Figs 12–15). For France (Fig 12) the settlement of Lattes with 24 vessels stands out (Py *et al* 2001, 254, note 1) while in Spain (Fig 13), 46 vessels (10% amphora MNI) have been found at the mining settlement of Fuenteovejuna 'La Loba'

(Benquet and Olmer 2002, 319 ff) and 22 vessels from the later second century BC layers at Valentia (10% amphora MNI) (Pascual Berlanga and Ribera Lacomba 2002, 310–2). One feature, which connects the 'caserne Niel', Lattes and Fuenteovejuna, is their involvement in industrial activities, trade and the possible presence of foreign merchants and traders. The 'caserne Niel'

provides additional finds which are unusual for a Late Iron Age site, including a writing tablet and writing equipment, intaglios, and toilet instruments, which might indicate the presence of foreign traders (Jud *et al* 2012). Finally, Greco-Italic amphorae with painted inscriptions written in Iberian have been recovered from Toulouse and Vieille-Toulouse and it has been argued that they indicate the presence of Iberian merchants and traders (Benquet 2007). The greater number of AT amphorae at Valentia could be linked with it being a Roman foundation to settle Roman veterans. On a related point, it is worth noting the presence of AT amphorae from several Roman military sites in Spain connected with the Celtiberian Wars (Numance) and the later Sertorian War (Cáceres el Viejo). The sites of Chôes de Alompé 'Móron', Lisbon 'Castel de São Jorge' and Santarém in Portugal, which have all produced AT amphorae (Table 6), have been linked with the Roman military campaigns of Decimus Junius Brutus (Mateo Corredor 2012, 125). The industrial settlement site of Gondole 'Les Chaumes' in central France which contains one AT amphora has also produced a small assemblage of Roman Republican military equipment (Deberge *et al* 2008; 2009). Similarly, recent excavations on the agglomeration at *Nasium* 'Cul de Breuil', outside the *oppidum* of Boviollles, have uncovered a varied and rich assemblage of Roman Republican military equipment and at least one AT amphora (Bonaventure *et al* 2012).

10. Conclusion

This review has shown a surprising number of AT amphora find-spots in southern and south-west France. Furthermore, find-spots are also found well beyond the Mediterranean coast in parts of central-eastern and north-eastern France. This provides a significant contrast with the mostly coastal distribution of AT amphorae in Spain. It is likely that the number of find-spots for France will continue to increase and vessels will turn up on many of the major settlements and *oppida* from central-eastern France.

The dateable find-spots from France demonstrate the long-term and stable (albeit at a relatively low rate), importation of AT amphorae from *c* 170/160 BC until the later first century BC. This indicates a much longer history for the exportation of olive oil from Tripolitania to north-west Europe and possibly a greater penetration of the western market than previously thought. Given the rarity of later Tripolitanian I and III olive oil amphorae outside of Mediterranean France, this is rather surprising. Although many African amphorae have been reported from third to fifth century AD contexts at Toulouse the majority of vessels are of Tunisian origin (Amiel and Berthault 1996; Berthault 2007). At Lyon North African amphorae remain rare until the third century AD onwards and only 14 Tripolitanian I–III amphorae, mostly of the later type III, have been recovered (Lemaître *et al* 2011).

The development of the Tripolitanian olive oil trade should be sought in the period following the end of the second Punic War in 201 BC and at the least clearly predated the final destruction of Carthage in 146 BC and the Roman conquest of the region.

As regard the provenance of the AT amphora the majority of vessels from the 'caserne Niel' and other sites in France appear to be of eastern Tunisian origin rather than from Tripoli and *Lepcis Magna*. However, some petrological analysis will be required to confirm this given the noted difficulties in differentiating North African amphora fabrics (Peacock 1984). The absence of kilns firing AT amphorae in Tripolitania could be sought in the production of this form in a limited number of large-scale factories situated on the coast and near to the main ports. The olive oil produced on the inland farms would then be transported in skins or wagon mounted casks, to be bottled for export at the main ports. In contrast, the later Tripolitanian I and III appear to have been produced at numerous kilns near to or directly linked to the olive oil producing sites of the interior.

The frequency of AT amphorae at some sites suggests that the olive oil carried within them was particularly favoured because of its quality or price by Roman merchants and military personnel. AT amphorae are found on several Roman military camps in Portugal and Spain, as well as several French sites (Bibracte, Gondole, *Nasium*) with evidence for the presence of Roman military personnel during the Gallic War. They are also known from sites used to settle Roman veterans (Valencia), colonies (Carthage), associated with mining (Fuenteovejuna) and trading sites (Toulouse, Moullets-et-Villemartin) with possible enclaves of Roman traders. Finally, examples are also reported from important administrative capitals, such as Lyon. Perhaps many Tripolitanian amphorae were supplied directly to the Roman state or the military, or Roman merchants were heavily involved with the exportation of these vessels to Spain and France. It is possible that Roman individuals played an important role in the development and intensification of olive oil production in Tripolitania and in the actual development of the AT amphora itself. This would explain why Tripolitanian olive oil was exported in an amphora clearly modelled on Hellenistic and Italian vessels (Brindisi amphora, Republican ovoid amphora) rather than local Punic types (these vessels were also appearing at the same time as the AT amphora; for example, amphorae from Brindisi and Republican ovoid amphorae are found at Toulouse 'caserne Niel' in features dating to *c* 170/160–140 BC (Loughton and Alberghi 2012)). Although it has been suggested that the AT amphora may have developed out of the Punic Van der Werff type 3 amphora (Bonifay 2005) this seems unlikely. It is also possible that African exporters were attempting to pass off Tripolitanian olive oil as Italian and gain access to an important expansive market.

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A gazetteer of the incidence of less common samian ware fabrics and products in northern and western Britain.

Part 1: Introduction and South Gaulish fabrics

Margaret Ward

1. Introduction

Brian Hartley's seminal work of 1972, entitled 'The Roman occupation of Scotland: the evidence of samian ware' published in *Britannia*, was both revelation and inspiration, highlighting the significance of samian ware found on the northernmost frontier of the Roman Empire. Patterns of presence, but also of absence, were evident in the supply to Britain. Hartley's findings were expanded upon and analysed by Steven Willis (2005 and 2011). Their research draws to our attention not only trends, but deviations from what may be considered the normal patterns of samian distribution in Roman Britain. The aim of this paper is to present further evidence and to raise questions by illuminating some anomalies amongst what may seem a random array of Roman rubbish, but is one that contains unexpected 'riches'.

2. The Gazetteer

2.1 Contents

The current paper presents a Gazetteer of those less common samian ware fabrics, which for convenience here may be termed 'minority wares' or 'minority products', augmenting Willis' compendium of 2005 with finds recorded by the writer: many were from well-stratified contexts and almost all were from formal excavation (Fig 1). Further examples discovered by others' research are raised for comparison, as are some newly identified anomalies stemming from them. Attention is focussed primarily on:

2. Central Gaulish products from Lezoux made in the early, or so-called 'pre-export', period before the main phase of production began there in the 120s
3. 'Black samian' products manufactured at Lezoux in the second century
4. Products from the more loosely grouped East Gaulish workshops of the second century which largely pre-dated the main period of production at Rheinzabern and Trier
5. Central Gaulish products considered possibly to be candidates for exemplifying third-century production; under discussion here are those vessels which are more reliably datable: the mortaria and products with potters' stamps or moulded decoration

Samian products from the conventionally named South, Central or East Gaulish centres of production are hereafter referred to as SG, CG and EG. Those products which reached Britain from South Gaul were primarily from La Graufesenque, occasionally from Banassac and the Lot Valley potteries, and from Montans. Within Central Gaul, aside from individual products from Les Martres-de-Veyre, attention here is focussed on Lezoux, with passing reference to occasional arrivals from lesser satellites at Lubié, Vichy and Toulon. As for East Gaul, some Trier products were arriving in Britain a few years before those of Rheinzabern and before the main period of exportation (that being, at both centres, largely from the mid-Antonine period onwards). Argonne products, discussed briefly below (Part 2), and other EG wares appear to have been reaching Britain in small quantities before AD 160. British finds include examples from lesser potteries such as those of Boucheporn and Chémery, Heiligenberg, Blickweiler and Sinzig and (with greater representation in Britain) La Madeleine (Fig 2).

1. South Gaulish products, which could have been made and exported after c AD 110, whether from Montans, Banassac or La Graufesenque

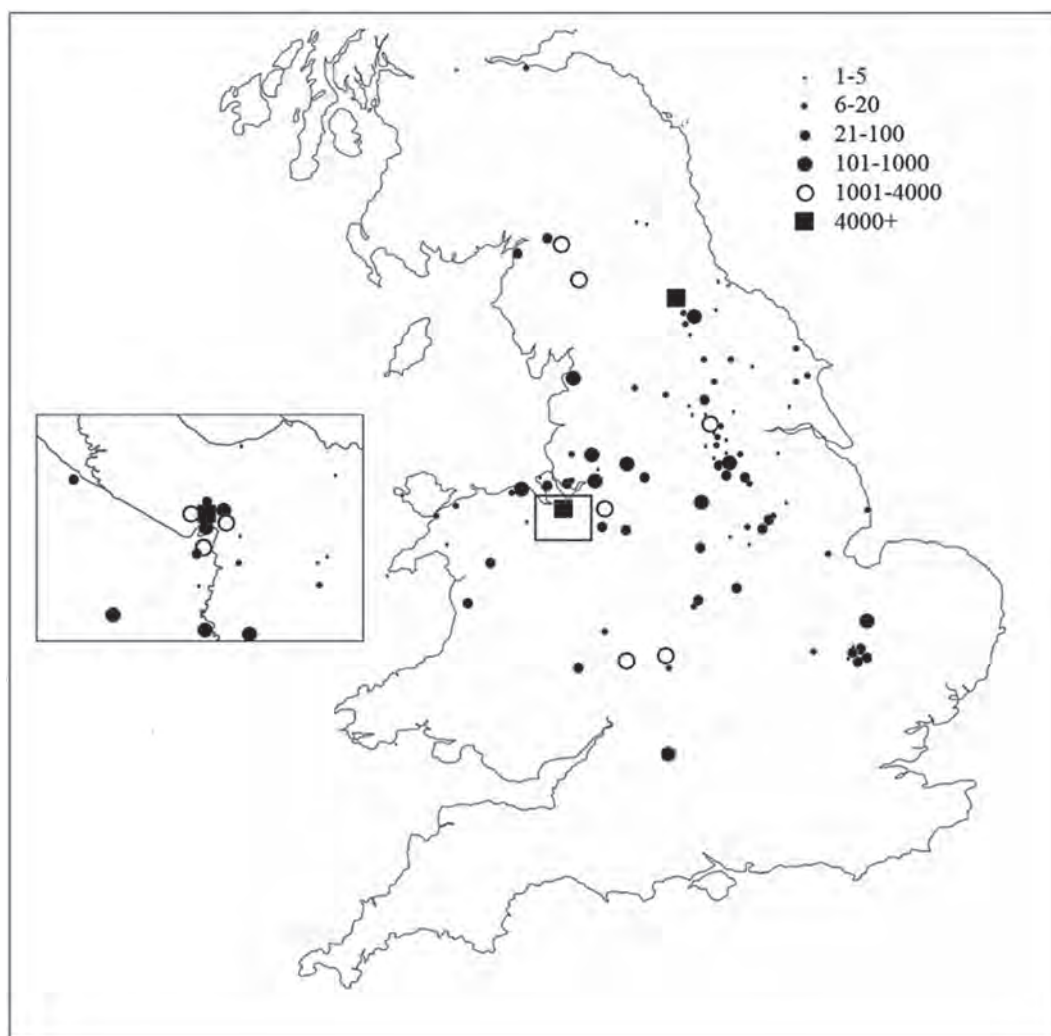


Fig 1. Location of sites in database showing maximum vessel numbers of all samian vessels present

2.2 Development of the database and Gazetteer

Samian were identified by the present writer since the late 1970s has been in the process of digitisation since the mid-1980s (S. Ward 1986; M. Ward 2012). The database currently includes records of more than 30,000 vessels representing many more thousands which were catalogued manually. They were excavated at more than 250 locations distributed unevenly around Britain (Fig 1). An attempt was made in very general terms to sort the data by site-type (Ward 2011a). Looking at the material from all site-types, numerous anomalies were clear. When seen in juxtaposition with Willis' e-published findings (2005), as stated, it is not radical to expect the larger samples to provide the greater likelihood of finding anomalies. Where not otherwise stated, quantified comparisons are based on estimated maximum numbers of vessels. The overall sizes of samples per site are not listed below, but Fig 1 provides locations giving general sizes of all samian assemblages in the database,

both those with finds represented in the Gazetteer and those with no anomalous material. Evidence concerning specific anomalies and 'minority products' was extracted from the database and is presented in the Gazetteer. It is generally the case that decorated and/or stamped vessels are more securely assignable to specific workshops and indeed to the general areas of production represented by the potteries on Fig 2. However, in order to present all available evidence, plain sherds have been listed where their origin is strongly indicated.

Gazetteer entries thus represent all those identified as our so-called 'minority products'. They are then divided by fabric (SG, CG, and EG), with attention focussing on those products that lie outside the norm for finds in Roman Britain or in specific areas thereof. Most entries have not previously been published; many are from excavations where full publication is not envisaged. A recurring theme in this paper is that, like a jigsaw, an overall picture only emerges when sufficient pieces are present and adjoin.

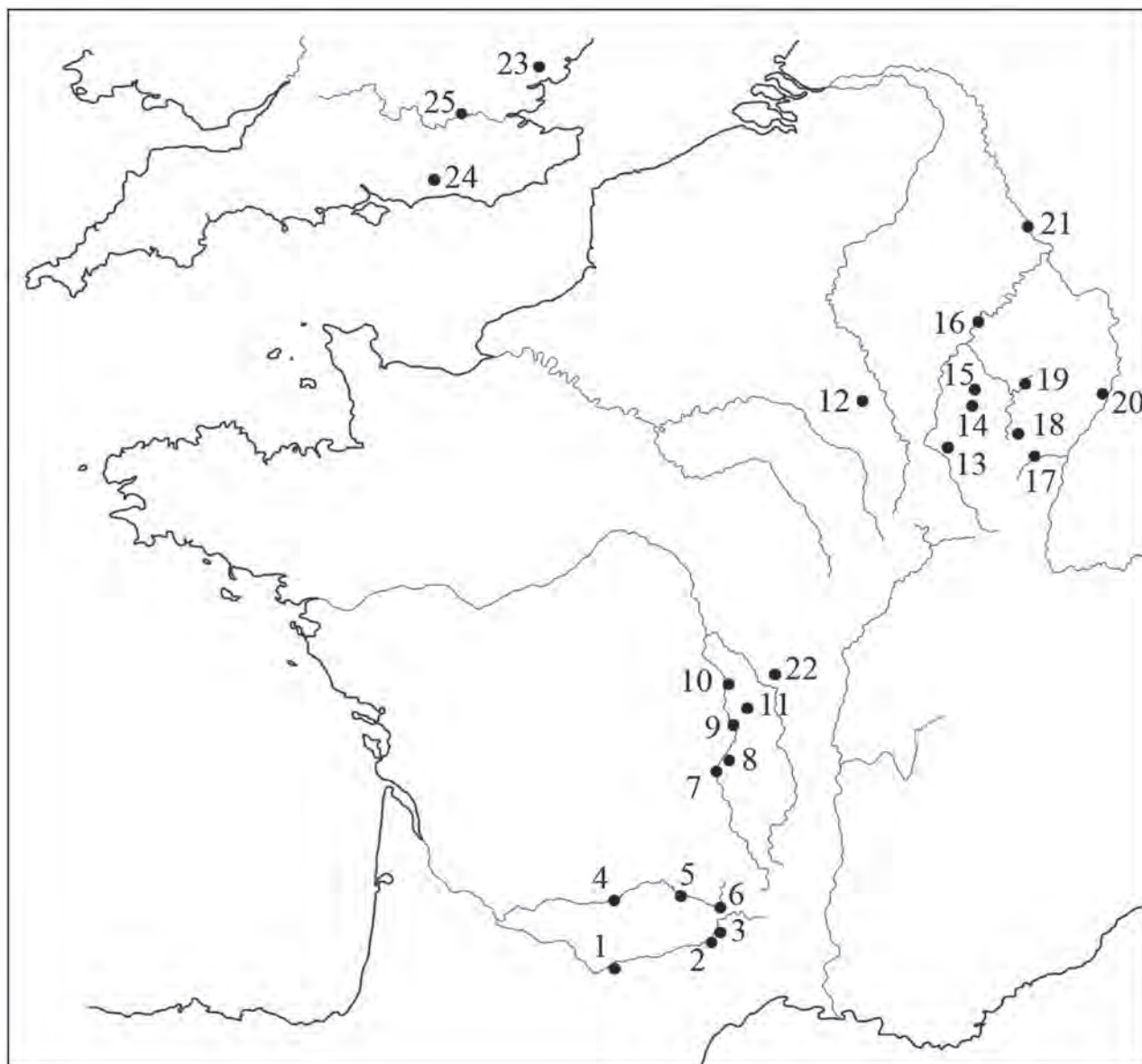


Fig 2. Samian kiln sites. 1: Montans, 2: La Graufesenque, 3: Le Rozier, 4: Carrade, 5: Espalion, 6: Banassac, 7: Les Martres-de-Veyre, 8: Lezoux, 9: Vichy, 10: Toulon, 11: Lubié, 12: Argonne kilns, 13: La Madeleine, 14: Chémery, 15: Boucheporn, 16: Trier, 17: Heiligenberg, 18: Mittelbronn, 19: Blickweiler, 20: Rheinzabern, 21: Sinzig, 22: Gueugnon, 23: Colchester, 24: Pulborough and Wiggonholt, 25: ?Aldgate (London)

The evidence for Chester may be out-of-kilter, since its major excavations and many thousands of samian vessels, particularly from the fortress, are still unpublished. An initial scan-through of samian ware in the late 1970s and 1980s was intended to be just that; the record remains incomplete (see Appendices included with Part 2).

2.3 A northern and military bias

Figs 3–5 show the geographical distribution of those later SG, ‘early Lezoux’ and early EG finds reported on by the writer (Figs 4–5 will appear in Part 2). Maps have not been provided for ‘black samian’ or for the possibly third century CG wares. For ‘black samian’

there are insufficient find-spots to warrant mapping, two of them more southerly (Alcester and Worcester). For third century CG wares, finds made thus far have not merely been noted at very few sites, but they are as yet somewhat tentatively identified and dated; most of those few northern finds which were conceivably produced in the third century are datable only broadly in the very late second or possibly early third century.

Find-spots of the ‘minority products’ were scattered across areas from the Firth of Forth and Hadrian’s Wall to Yorkshire and the East Midlands, from Anglesey to mid-Wales, and from the Marches and West Midlands to Cambridgeshire. Most sites reported on by the writer have

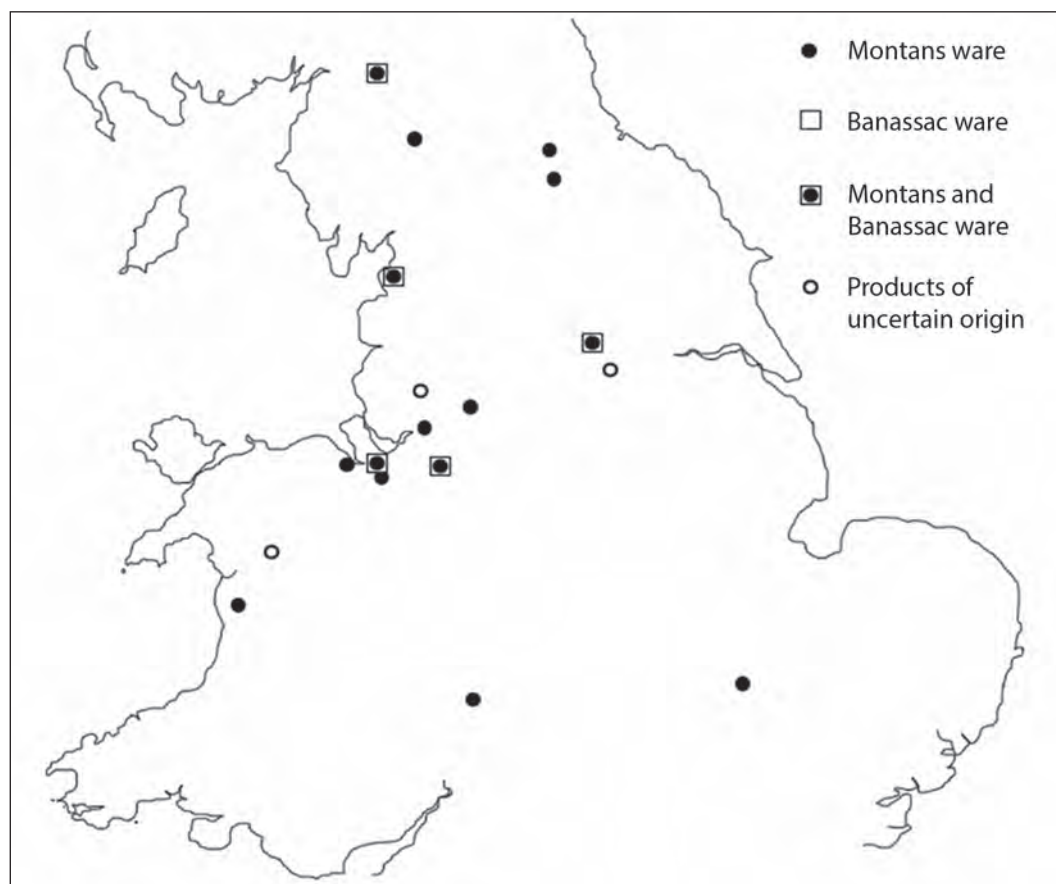


Fig 3. 'Minority' South Gaulish fabric finds by location in northern England, plus find-spots in northern Wales, Cambridgeshire and Alcester. (Banassac ware has only been recorded to date at sites that also have Montans ware)

been northerly, but a few outlying locations have included Wiltshire (Groundwell Ridge), Worcester, Alcester and Cambridge itself (Fig 1). In previous discussion as to which areas constituted 'North' and 'South' of Roman Britain, the Fosse Way and Watling Street were taken somewhat arbitrarily to serve as a dividing line (Ward 2011a, 77). 'South' were those sites in the zone discussed by Taylor in his *Atlas of Roman rural settlement*, where we see more villas, roadside settlements, small towns and large towns (Taylor 2007); 'North' were those in that zone which reflects in general terms the renewed military advance in the Flavian period. This Gazetteer by force of circumstance (being geographically, but otherwise randomly, swayed by archaeological commissions received) concentrates attention on finds from the northern and western zone. All finds reported on by the writer have, however, been included on the overall distribution-map (Fig 1) and in the Gazetteer.

In attempting to draw any conclusions we must beware of the bias within the database perhaps towards the West and certainly towards northern sites, and thus towards those with a military connection. Nevertheless, it is possible to discern some patterns in distribution which could usefully be tested elsewhere. Hence, to a

large extent, this paper represents the beginning of a process and not its end.

2.4 Gazetteer: inclusions, absences and exclusions

Some of these 'minority products' are from minor or satellite workshops. Others represent the major centres of production, but the early phase of the local industry, as at Lezoux and in East Gaul. Others are from the years of decline: for example, in South Gaul at Montans, or in the later phases of the Central and East Gaulish industries. Geoffrey Dannell notes (pers. comm.) that clearly the samian industries, particularly in South and Central Gaul, did not suddenly disappear, but died off slowly; their moulded wares appear to reflect the diminution of human resources, exemplified in those very late and very poor products which reached Narbonne but not Britain. The decline of the industry, whether in South, Central or East Gaul, is not the subject of this article, but it is significant for present purposes that in the ultimate South Gaulish phase, distribution from the kiln site was fairly localised: long distance exports were rare and may have resulted from itinerant trade. We will see that these rare 'imports', our anomalies and abnormalities, whether found in Britain individually or in small groups, may represent occasional

losses by itinerant individuals, but those individuals could have been foreigners or locals. They could also have been military-related or private individuals, and, if tradesmen, they could have been arriving through contracts or 'on spec'. This also raises the interesting questions as to where and how consignments of samian were assembled for dispatch to Britain and elsewhere, and from transshipment points to consumer markets, and the degrees of variety and mixing of products they may have contained.

Such individual 'imports' to British sites from specific centres have included a dish from Vichy at Ribchester (stamped by Drippus; Dickinson 2000, 220; *NoTS* 3, 328–9), a bowl from Vichy at Catterick (Dickinson and Hartley 2002, 427 no 106, Cinnamus ii) and another bowl likely to represent Cinnamus' activity at Vichy (Wild 1975, 156).

From Toulon-sur-Allier the occasional product has been suspected. Potters active at Toulon, but also Lezoux included 'Tetturo (Tetturus / L. Immunius Tetturo)?' discussed in *NoTS* 9, 53–4 and in *NoTS* 4, 270–1 where all the L. Immunius bowls are from Britain, including Chester's (Stanfield and Simpson 1990, pl 173.6). Two bowls found at Walton-le-Dale and Corbridge appear to represent the same mould; see Wild 2012a, 221, where Dickinson notes concerning the former, that although this potter's moulds were certainly used at Toulon, its fabric suggests Lezoux production and 'it seems likely that Tetturo/Tetturus worked there, in view of the frequency of his wares in Britain'.

From further afield came a single sherd from a moulded bowl in 'Spanish samian ware', found unstratified at Catterick's Bypass site (Dickinson and Hartley 2002, 300, no 134), which has recently been reviewed along with Silchester's Anubis-related bowl in Iberian ware from the very end of the first century (Bustamente Alvarez and Bird 2013, 255–6, 258).

The Gazetteer reflects similar, though less exotic, arrivals of single items or small groups of the 'minority products' dispersed around Roman Britain. Larger batches of wares such as those from second century Montans have usually been presumed to reflect diffusion of vessels by troop movements. To avoid begging the question, evidence for consideration will be found in the relevant sections below.

Samian products were primarily tablewares, accompanied by vessel-types used for 'other functions in which they were socially visible' (Willis 2011, 209). This is not the place for debate concerning the chronology of standard tableware forms, whose meticulous discussion may be found elsewhere (eg Dannell 2012). Nor is this the place for in-depth analysis of the more unusual vessel-types, the focus of attention here being concentrated rather on the less common samian wares and their fabrics. Therefore unusual vessels in standard samian wares which have been found at specific sites are not

catalogued in the Gazetteer in regard to their specialised function, such as cantharus, patera, handled dish and so forth (Stanfield 1929; 1936; Bet *et al* 1989; Bet and Delor 2000). However, some forms, such as mortaria and the 'gobelets' (see Bémont 1977, 62) are discussed where relevant, and another speciality, the disc-mouthed flagon (Stanfield's type 67) will be mentioned as being one of the possibly third century CG products.

Rare finds in Britain (to be mentioned in Part 2) include products from the Central Gaulish area which are not standard red samian ware *per se*, such as the Gaulish version of so-called Pompeian Red Ware in the first century, and 'black samian' ware in the second century. Rare finds from South Gaul include its 'marbled' ware, as noted in Appendix 1. 'Marbled' production was at its peak from the Claudian era into early-Flavian times. So, too, was that of the rouletted cup of the so-called form 24/25 (usually 24, see Note 2), a form favoured for marbled production, but one that also arrived in Britain from early Lezoux. Although production of marbled products (and so-called form 24/25) is thought to have extended into the Trajanic period, marbled exports to Britain may have ceased in the 70s: factors of preferential distribution may be involved, but it is striking that, aside from York, they are extremely rare in northern Britain. Marbled ware does not feature in the Gazetteer as the writer has seen none in northern Britain outside the Yorkshire Museum's exhibits.

'British samian' products will not be discussed as they are not yet recorded as having reached the North from their south-eastern kilns (Fig 1). Their products represent the well-known workshops at Colchester with their southerly distribution (see Dannell and Mees this volume), and of the so-called Aldgate-Pulborough potter, whose scatter of products covers the Wiggonholt-Pulborough area and reveals outliers perhaps no further north than Norfolk. Evidence for samian production at Aldgate is scant, with a single waster, and so the label 'Wiggonholt-Pulborough Potter' may be more appropriate (Joanna Bird pers. comm.).

Argonne samian ware and products of the ensuing late Argonne industry are not included in the gazetteer, as quantities arriving in the North may be thought considerable enough to represent formal or standard trade rather than occasional arrivals. Admittedly, Argonne samian was not a very important element in British assemblages, particularly outside the South-East and the northern military zone. Nevertheless, in comparison with other 'minority' EG products, relatively large quantities arrived in the North from the Argonne potteries (Dickinson and Hartley 1971, 132, Table 1). Northern finds, mostly not stamped or decorated, have rarely been dated closely, although Hadrianic products may be suspected (eg Ward 2008a, D9.33 nos 11–12, from Piercebridge and the late fort's berm). At the other end of the spectrum, British finds of Argonne mortaria indicate continued exportation in the third century. Most of Britain's Argonne samian

finds surely came as regular imports in the early- to (probably) mid-Antonine production and they are not included here amongst the ‘minority products.’ However, both ‘standard’ and late Argonne wares will be discussed briefly in order to set them in context (Part 2).

Excluded from the Gazetteer are other ‘oddities’ which will require brief mention here. One, a shallow bowl found at Chester’s Abbey Green, was produced from a CG samian mould with ovolo and panelling typical of the early Cerialis ii–Cinnamus ii group’s style, made in a soft, orangey-buff fabric, containing mica and large white inclusions, with traces of thin red wash (with indistinct ovolo, perhaps B144 rather than 143, Perseus, O.234 and Apollo, Hopkins 2012, type 98a). It was recovered from the excavation’s *Trench 5 (521), Phase 5, deposit including fourth century pottery* (Bulmer 1979/80, 23, fig 9 and 1980a, fig 5.6). Now in poor condition, the clarity of the decoration is far removed from the original work, but the motifs being the same size as the originals rules out surmoulage, a technique noted at the Water Newton kiln site in reproducing CG decoration in orange-slipped white fabric (Gillam 1999, 35, no 159). Brian Hartley (in conversation, 1978) noted all the motifs on a bowl at Lezoux, signed by Cerialis ii (active AD 135–165; *NoTS* 2, 352) and felt that the two bowls could possibly have come from the same mould, though showing different parts (Hartley nd, disc 2, Chester 09). However, Chester’s bowl seems likely to have been produced from a mould used locally, perhaps at the legionary potteries at Holt, rather than in Gaul. It is known that non-samian ware bowls were produced from actual samian moulds in Germania Superior, away from the production centres. Away from the EG kiln sites also, numerous samian moulds have been found in both Germania and Raetia. See for these issues, respectively:

- http://www2.rgzm.de/Transformation/Deutschland/KeramikProduktion/KeramikproduktionGermaniaSuperior_English.htm#Liste4
- http://www2.rgzm.de/Transformation/Deutschland/KeramikProduktion/KeramikproduktionGermaniaSuperior_English.htm#Liste1

In Britain, a mould in the style of Drusus i (formerly Potter X-3) was found at York and thought probably to be from Lezoux (Simpson 1952, 68; see also Simpson 1995, 272; Stanfield and Simpson 1958, 16 and 1990, 77, concerning pl 16.206). It was seemingly one of two moulds recorded at York (see Note 3). The presence of these moulds and of the bowl at Chester suggests that further evidence of the use of samian moulds should be looked for in northern Britain.

3. Provision of Information

3.1 Provenance, dating, details and comments

The Gazetteer provides information as to site-type, such as fortress and amphitheatre, fort, canabae or vicus

(‘extra-mural’), ‘industrial sites’ (those industrially related sites with military links; Note 4), and other settlements. Entries in each section of the Gazetteer are ordered primarily by the excavation’s site-provenance. Contextual information and site-phasing, or publication references where available, are provided for each record. Those excavations which have been given no publication details were unpublished in 2014.

Production dates of individual items in the Gazetteer are given only where specifically important, as their chronology is broadly discussed within each subsequent section which provides discussion of background. General ranges such as c AD 70–110 may be provided rather than the traditional use of epochs, as in this instance ‘Flavian–Trajanic’ or indeed ‘Flavian to mid-Trajanic’. Neither the numerical nor the traditional usage should be taken to imply precision. Nor should precision in dating the decline or collapse of production at and exportation from the kiln-sites be inferred from general date-ranges (see *NoTS* 1, 8). Where epochs such as ‘Trajanic–Hadrianic’ or ‘Hadrianic–Antonine’ are referred to, they are used in the broadest sense and are not intended to span the mid-points in those ranges (*cf NoTS*, 1, 4). The more specific numerical date-ranges (eg AD 135–65) generally reflect the chronology of a specific potter’s activity as given in *NoTS*. Nonetheless, allowance must be made for possibilities of storage before sale, and also survival in use (*NoTS* 1, 4–5).

Individual entries in the Gazetteer list vessel types and forms, using Dragendorff’s (1895) catalogue numbers unless stated; for other terminology and abbreviations, see Webster 1996 and the bibliography below. Comments on decoration and stamps are given in detail where unpublished, but are given more succinctly where published (Note 5). Hartley and Dickinson’s numbering system from their Index of potters’ stamps in nine volumes (*NoTS*) is used, with Roman numerals in lower case following the potter’s name. Other enumeration, including upper-case Roman, denotes cataloguing systems mostly pertaining to decorative styles, which were devised by earlier workers such as Stanfield and Simpson, Rogers (1974 and 1999), and Ricken followed by Fischer and Thomas. Plain sherds are catalogued here where their ‘minority’ status is strongly indicated.

Comments on physical characteristics are included wherever they may be helpful, although they are somewhat more subjective than they are scientifically reliable. For instance, no distinction is made between golden and silver mica; however, none of the micaceous content seen was of the black variety. Mineral content is noted only where obviously unusual. Calcitic inclusions which vary from yellow to white or grey are simply termed ‘calcareous’.

3.2 Identification of samian fabrics: some problems

In this paper identification of samian fabrics will be a

recurring theme with variations. Some of the samian fabrics likely to be encountered were illustrated by Tomber and Dore (1998) with Munsell Soil Colour numbers assigned to those few 'standard' types. Those illustrated are, however, very few, and the Introduction to their work reveals that the authors were very aware of the difficulty of numbering any of the very subtle variations. Amongst such variety, subjective descriptions obviously vary, but allocation of 'precise' Munsell colour number can be even more misleading in their apparently scientific, but equally subjective, comparisons. Individual views of the colour red seem to vary. As Hartley and Dickinson indicated (*NoTS I*, 3), identification of plain samian is not as simple as it may seem from brief encounters. Caution is advocated concerning over-simplification of fabric categories. In Central Gaul, there was considerable dichotomy at Les Martres-de-Veyre between those distinctive vessels, highly fired and of high quality, by Trajanic potters and those produced in the late-Hadrianic to early-Antonine phase (eg by Cettus). A wide fabric-range was produced across zones at Lezoux, as for instance in the Ligonnes (Vertet and Hartley 1968, 218; Delage 1998, 275 fig 1; Delage 1999, vol 2, 122, 2.31). According to Brian Hartley (pers. comm. 1978) some wares from the Ligonnes excavations resembled the highly-fired, red products of Les Martres-de-Veyre, while others (again from the Chantier Audouard) were very micaceous and had a more orange slip. We must trust that any future publication of the Hartley archive (which is kept at Cardiff University's Centre for Lifelong Learning) will be able to publish fabric descriptions.

Products from satellite factories include those of Vichy, such as Catterick's Cinnamus-type bowl in reddish ware (Dickinson and Hartley 2002, 427, no 106), but have been suspected in other fabrics (eg in a light yellowish fabric with dark brown glaze, as in the case of a bowl with stylistic connections to Docilis and Cinnamus, found at Birrens (Wild 1975, 156 no 17)). At Brancaster, a Banuus bowl (die 2a; *NoTS I*, 11) was considered too orange to be Lezoux ware and more likely a Terre-Franche, Vichy or Lubié product (Dickinson and Bird 1985, 74). Delage (2012, 130–1) noted that at Lubié, surfaces tend to be matt, 'rouge fonce ou marron', perhaps deep red, on a salmon-red paste. Work is clearly needed to establish whether bowls found in Britain were made from moulds produced at Lezoux or at satellite factories. In addition, it is as yet uncertain whether any samian ware reached England from lesser potteries such as Gueugnon (Notet 1986; 2012) in the 'Centre-est' area (see Note 6), or perhaps an occasional vessel from the 'Centre-ouest' (see Note 7). 'One-off' finds from minor production-centres need comparison with an accessible fabric bank as recommended (Willis 2004, 5–6), together with scientific analyses, if we are ever to identify them in Britain.

Over-simplification is confirmed when seeing the

possible confusions between EG wares (Rognant-Bena 2011, 308). Peter Webster (pers. comm.) notes that Brian Hartley had distinguished c 36 different fabrics, mostly SG and CG, and with much work remaining to be done on EG fabrics, that number would considerably increase. Unforeseen difficulties can be encountered amongst fabrics unfamiliar in Britain, and particularly those multifarious EG products. In the absence of scientific analysis or state-of-the-art microscopes which most samian specialists lack, fabrics can be ambivalent, even for those with microscopic vision. To exemplify some of the problems in distinguishing between the unusual and the mundane: several sherds in brown-slipped crumbling fabrics were noted in the Gazetteer at the industrial, and probably military, related site in Wigan (the Wiend 1983 and the Grand Arcade 2004–5 excavation with its bath-house (Miller in Burnham 2006, 399)). These sherds were of uncertain origin in the earlier second century, whether produced at Lezoux or contemporary Montans, or even from the Argonne, amongst its paler fabrics. Such are the vagaries of fabric identification.

4. 'Unusual' South Gaulish wares (Fig 3)

These wares are 'unusual' when seen as site-finds in their British contexts. The various potteries in South Gaul have been reported on by their excavators, and Britain's samian supply from them has been studied in depth in recent years by Geoffrey Dannell, Allard Mees and others, their work succinctly summarised by Bird (2003, 119). Here, it will suffice to give a brief and very general overview in broadly chronological terms across production centres.

Most samian vessels reaching northern England from South Gaul emanated from La Graufesenque, with production dates within the pre-Flavian to early Trajanic periods. Only briefly mentioned will be Montans products of first century date. They are extremely rare in northern Britain (Willis 2005, 6.6.1–2; *NoTS I*, 8), whether Flavian or pre-Flavian.

At Flavian foundations in the North, we might expect to find some older vessels introduced to the site. By tradition, pre-Flavian products from La Graufesenque mostly occur at military-related sites. It is, however, difficult to distinguish between specifically Neronian and Vespasianic vessels unless the stamp indicated that its potter's activity was exclusively pre-Flavian (eg at Chester fortress, stamps such as one by Senicio, see Note 8). Stamped or unstamped, the production-dates of many (probably Flavian) vessels appear to span the pre-Flavian to Flavian period; this ostensibly increases the pre-Flavian presence implied on raw graphs (see Ward 2011a, 81 and fig 14). In the case of those certainly pre-Flavian vessels found in the North (Note 9), are we looking at military movements of personal possessions? Are they likely to reflect the movements of merchants who were following the military from the early years?

Few vessels which were conceivably pre-Flavian products seem to have been found at 'non-military' locations. On that basis, it could be argued that any incontrovertibly pre-Flavian products found at rural sites, remote from forts, lie outside the normal northern patterns for these 'other settlements' (*cf* Ward 2011a, 81, fig 22). We must avoid the circular argument that pre-Flavian sherds *per se* are proof of military occupation. Of all the records made by the writer from 'rural' locations, only one vessel was dated exclusively within the pre-Flavian period, this being a flat-flanged bowl of form Ritterling 12 found amidst finds ranging across centuries at Meols on the Wirral (Ward in Griffiths *et al* 2007, 52). Earlier than Chester's Neronian-Vespasianic examples of Ritterling 12, this was presumably Claudio-Neronian or even Claudian, the closest parallel being a bowl from Colchester (Oswald and Pryce 1920, pl 71.2). Even at a site so remote, a military background has been postulated for the pre-Flavian array of finds (Griffiths *et al* 2007, 388–90). Was naval activity reflected by such material? Was it an embarkation point for military operations in the North? Was it a transshipment-point for Chester (Carrington 2012, 346, 382)?

Closely related to La Graufesenque were the minor potteries in the Lot Valley, as at Espalion and Carrade (Cajarc). They are discussed in general and in detail elsewhere (eg Mees 1995, 119–25; Polak 2000, 30–2; Pauc 1972; Tilhard and Bouquillon 2009; Tilhard *et al* 2012) and are noted only briefly here. First century products from both Espalion and Carrade arrived in Britain, as did those of La Graufesenque's close satellite, Le Rozier, noted (relatively speaking) more often in the South, at sites including the Pepper Hill cemetery, Kent. It is clear that they were rare arrivals and they have been even more rarely recognised. Indeed, their fabrics are said largely to be indistinguishable by eye from other SG products and thus they are recognisable mostly on the evidence of decoration or stamps. One instance was found in the annex ditch of the first Flavian fort at Carlisle: a variant of bowl form 37 with flaring rim and internal fluting at ovolo level, its fabric and glaze were indistinguishable from the rest of the SG samian; together with the form, its decorative parallels with bowls at Newstead and Ribchester indicate an origin at just such a satellite of La Graufesenque. Other military find-spots include Wroxeter fortress (Dickinson 2002, 153) and Caerleon fortress (Dickinson 1993, 91) and its canabae (Hartley 2000, 181). Northerly locations recorded for Espalion products include Inchtuthil, Castleford, Ribchester, Catterick and Carlisle (Tilhard and Bouquillon 2009, 301), while a bowl from Bowes is suggested to be a product of the Lot Valley (Wild 2009, fig 44.8). 'Minority products' at Chester included a bowl of form 37 from Cajarc (Carrade), with similar decoration recorded at Fishbourne (Dannell 1971, fig 132.62) and at the production-site itself (Pauc 1972, pls 9 and 19–20).

The Chester bowl was found in 1966 in two contexts in the Defences area at Frodsham St (Ward, unpublished report). Pauc (1972, 44) noted Cajarc as producing all its moulded ware probably in the first century and as normally having had a strictly local distribution. Complications can arise even at the centres of production. Hartley and Dickinson have noted the possible export of moulds between La Graufesenque, Espalion and Carrade (*NoTS* 1, 8). More recently, chemical analysis of kiln furniture as well as of moulds and pottery has indicated that while some moulds found at Brive were produced there, bowls were certainly made in the vicinity of Espalion (Tilhard and Bouquillon 2009, 50; Tilhard *et al* 2012, 161–2, 165). A further complication can arise with stamped vessels, when they represent dies used at both Carrade and Espalion (*NoTS* 1, 8). 'Wandering potters' noted in the North have included Natalis iii, active 'AD 90–120?' whose products cause problems: he perhaps moved from the Lot Valley to Les Martres-de-Veyre (*NoTS* 6, 219). When found at Prestatyn, a dish of form 18 or 18/31 stamped with this potter's die 1a, was thought likely (largely based on its distribution patterns, as well as its fabric) to have been produced at Les Martres-de-Veyre (see Dickinson in Ward 1989, 150).

Those La Graufesenque products of the Domitianic to early-Trajanic period include bowls with what was immortally greeted by Brian Hartley as 'that Ovolo' (numbered RGZM 000035, when accessed in December 2014; for the RGZM database see below): its poorer impressions or versions are ubiquitous on England's northern sites. Their presence may support site occupation in or from the 90s and into the second century. While the general *terminus ante quem* currently given for exportation from La Graufesenque to Britain has traditionally been c AD 110, there may be deviations: some of its exports were doubtless produced in the Trajanic period, though whether that was after AD 110 is unclear (*cf* Mees and Polak 2013, 43, figs 4.10–11 and 47). The absence at Scottish sites, but frequency in northern England, of work related to 'Mercator, Biragillus and L. Tr- Masc(u)lus' was noted by Wild (2012b, 238); their named bowls reached sites including Chester, Carlisle and Chesterholm/Vindolanda. As yet unrecorded in Scotland are bowls bearing names such as T. Iulius Aplastus, T. Flavius Secundus and L. Cosius. The potter T. Iulius Aplastus, active 'AD 85–120', is known to have worked at Banassac but all the stamped British finds, including a bowl form 37 from Alcester and dishes from Carlisle and Corbridge, are likely to have been made at La Graufesenque, where he has been considered one of the latest exporters (*NoTS* 4, 341–2). The potter T. Flavius Secundus was noted by Mees (1995, 94–5) as working at La Graufesenque c AD 100–120 if not later, but more recently the range AD 80–120 has been suggested for his activity at La Graufesenque and Montans (*NoTS* 4, 81). Although he is represented by stamps in Britain only at Dover and Caerleon, bowls

related to his style found in northern England include a bowl from The Wiend, Wigan in the Gazetteer. One of the latest La Graufesenque potters was L. Cosius (*NoTS* 3, 129). His work, represented in northern England and in Wales, usually survives unsigned (eg a bowl from Caerleon, Vine Cottage; Bird 2012, fig 14.2.6). Other examples of his late work, found on the continental mainland, are known to have been produced no earlier than AD 116 (Appendix 2).

Details of the RGZM (Römisch-Germanisches Zentralmuseum, Mainz) database can be accessed at www.rgzm.de and, on the database and related information, see Dannell and Mees 2013. The database is a 'work in progress'; code numbers allocated to *ovolos* are for this reason provisional and may be subject to change. Vessel numbers are said to be unlikely to change. As records may be revised, the codes quoted here are accompanied by the date of access to the database.

Whilst first century Montans products are scarcely found in northern Britain, its earlier second century products appear widespread across the south and east of England, strongly represented at some sites such as Richborough, London and Verulamium, though again reaching as far west as Exeter (Willis 2005, 6.6.3). Distribution maps show none in an area from Essex to North Yorkshire (Tyers 1996, 112; Willis 2005, 6.6.3). They were only a little more evident in that area's records in the Gazetteer (Fig 3) and while recorded Montans finds may have increased slightly in recent years, find-spots have remained few in number in north-eastern England and on Hadrian's Wall compared to the West. There they are spread diffusely, if somewhat erratically, from Wroxeter northwards and are associated particularly with the Chester, Wilderspool and Manchester region up to Cumbria. Find-sites of Montans ware in Antonine Scotland are widespread, with a comparatively high number of examples recovered at Inveresk (see Wild this volume). Their distribution is further discussed below.

Vessels from Banassac are found far less commonly at north-western sites (and in Britain in general) than are the contemporary Montans products. Though the moulding of Montans bowls relied often on surmouldage of La Graufesenque's originals, those products are usually more easily recognized than are those from Banassac, particularly when the latter are plain and unstamped. Nevertheless, moulded bowls from Banassac have been identified at various locations which include York. The list below confirms these general trends, including the sparse recognition of Banassac products. There are numerous records of fragments, whether from Banassac, the minor potteries, or indeed Montans, published in northern excavation reports only as 'unusual' SG wares or amongst 'the latest SG products' to reach Britain (eg Heronbridge, Hartley 1952, 14; Hartley and Kaine 1954, 27, 29, and Ravenglass, lacking an *ovolo*, Wild 1979, 132 no 28). With knowledge of the lesser, and the later,

SG centres increasing, such references when found will warrant review. Some late SG bowls are only tentatively 'identified' along with the more firmly recognised Montans and Banassac products in the Gazetteer (Fig 3). More such bowls were suspected amongst many thousands of samian vessels from Chester's unpublished excavations.

5. Montans Products

5.1 Montans products: Gazetteer (Fig 3)

All vessels were second century products unless stated; the dating of specific potters is considered in Section 5.2.

Chester

Chester fortress. Note that where Chester reports lack published references these unpublished excavations were by Chester City Council and English Heritage; archives currently stored by Cheshire West and Cheshire Council. 'GM' denotes the Grosvenor Museum's record, or accession, number.

Old Market Hall: cup form (27?) with stamp from die 1e of Q. V- C- (*NoTS* 9, 134). *CHE/OMH 1, 1966–7, area of 1st cohort building, context AZ/BG.*

Old Market Hall: cup form (27?) with stamp from Q. V- C- die 1g; 'fortress, exc X4/NW YDU' (*NoTS* 9, 134). *CHE/OMH 3, 1967–9, context YDU.*

City walls, North: cup form 27 with stamp from Q. V- C- die 1e, but perhaps not one of the two listed in *NoTS* 9, 134, which were located 'outside fortress'. *City walls, nr North Gate;* catalogued by Hartley in Grosvenor Museum archive at *Acc No GM 216M.*

Deanery Field: cup form 33 with stamp from Chresimus die 4f'. See Newstead 1928, 30, no 4: 'very small 33, slightly discoloured by fire', from Room 4A, block B, surface of second floor. *NoTS* 3, 8: 'cup' from 'Chester, fortress'; catalogued by Hartley as form 33 in Grosvenor Mus archive, *Acc No DF 1928; GM 168M.*

Bridge St: dish form 18/31; chocolate brown-slipped, heavily calcareous fabric, presumed to be Montans ware; Ward 2008b, 164. *25 Bridge St 2001; Phase 2b (1138).*

Chester, extra-mural locations

Amphitheatre: SG cup, fabric containing occasional, large, calcareous inclusions; perhaps a Neronian product. Stamp, tentatively identified as representing, with slight differences, die 2a of Cunasus i (*NoTS* 3, 219; AD 55–80), who produced indeterminate cup forms at Montans. *Amphitheatre 2004–06 excavations, Trench B, post-med Phase 14 (2438).*

Amphitheatre: form uncertain, stamped S[...] or else, retrograde [...]P or [...]R on what may have been a large form 35 or small 36, but with an unusual foot and glossy brownish red surface on orangey pink fabric containing occasional, and tiny, calcareous inclusions; first century Montans ware is tentatively suggested. For discussion of stamped forms 35 and 36 see Gazetteer entry from

Chester, Love St, below. *AMP 2004–06, Tr B, post-med Phase 13* (2455).

Amphitheatre: dish form 18/31R; poor, dull brown-slipped, pale and crumbly fabric from second century Montans. *AMP 2004–06, Tr C, post-med Phase 14* (3059). *East of the fortress*

City Road: an unusual variant of moulded bowl form 29; see Willis 2005, 6.6.2 on form 29s, variants only, from Montans (eg Dickinson 1988, fiche 1:A7 2.47 from Inveresk). Poor brown-slipped, pale fabric lacking mica, now considered more likely to be second century Montans than Trajanic Lezoux ware (cf Ward 2008c, 115, fig III. IV.9B): the decoration included a figure on a stand (cf Simpson 1976, 266 no 36) and badly blurred leaf-and-bud motif, which might have been a CG type, but seems similar to those on Montans bowls at Inveresk (Felicity Wild pers. comm.). *Rylands Garage, City Road 2004–5, Tr 4* (205), *second century context*. (See also Part 2, under Trajanic Lezoux products, City Road).

Union St: form 27 with stamp from Q. V- C- die 1d. Listed as ‘Chester canabae’ in *NoTS 9*, 133. Hayter 1925, 23, no 107: *Union St, New Baths, Aug 1900*.

Love St: cup, identified by Robert Newstead as form 35 (1939, 102, no 45). Form 35 (and 36) was indeed stamped, occasionally at Montans (Brian Hartley pers. comm. 1983; Martin 1986, 68) and a La Graufesenque potter, Martialis i is known, eccentrically, to have stamped forms 35 and 36 (Dannell 2012, 61). However, this stamp, representing die 1e of Q. V- C- was listed as ‘form 27’ and ‘outside fortress’ in *NoTS 9*, 134; it was catalogued by Hartley in the Grosvenor Museum archive as being form ‘27’ and from *Love St 1936–7, Box 9*.

Love St: cup form 27 with stamp, die 4f’ of Chresimus. Probably that listed as Chester, civil settlement, pot without number (*NoTS 3*, 8), but see Newstead 1939, 100, no 26. Catalogued by Hartley in Grosvenor Museum archive as *Love Street 1936–7, GM 65M*.

The Bars: moulded bowl form 37, with foot resembling form 29 and brownish slip on crumbly buff fabric and basal stamp by Chresimus, die 4a, listed as civil settlement (*NoTS 3*, 8). Located in the Grosvenor Museum’s Winsford store in 2013. *The Bars, Dee Lane 1953, GM 123M*.

Potts Collection: cup with stamp of Chresimus, perhaps that listed in *NoTS 3*, 8 as die 4f’ and ‘27?’ from Chester, civil settlement, pot without number. Recorded as form 33, ‘rather small cup, domed base’ (Hayter 1925, 16, no 31) and catalogued in Grosvenor Museum archive as form 33: *Potts Collection, GM 501M*. Provenance uncertain.

South of the fortress

Lower Bridge St: 2–3 vessels: 1–2 cups of form 27 with ungrooved rim and a bowl of form 37 suggested by Hartley from personal inspection to be a second century Montans product. The bowl was represented by an undecorated piece in a very pale fabric, with its

footring added in pink clay. *Hotel Romano, 49–51 LBS 1990, Tr 4* (358).

Lower Bridge St: Form 37 with very coarse panelled decoration and fragment of ovolo yet to be identified, but possibly from Montans. *Hotel Romano, 49–51 LBS 1990, Tr 4* (286).

Elsewhere

Heronbridge (settlement south of Chester): 3–4 possible Montans products, all mere fragments found in post-Roman contexts.

Heronbridge: indeterminate form; cup form 27; *Tr 7* (142), *Anglian fill of mass grave*.

Heronbridge: bowl form 37 in brownish-slipped, highly calcareous pinkish buff fabric with leaf-and-bud ornament as used by potters including Florus iv (cf RGZM 0006156a). Florus iv worked at La Graufesenque, before his Montans phase (*NoTS 4*, 95), but at Inveresk, a bowl with this motif as a basal wreath was a Montans product (Felicity Wild, pers. comm.). *Chester Archaeol Soc excav 2004, Tr 7* (131) *topsoil*.

Flint, Flintshire (‘industrially related site’): two stamped vessels. Large cup form 27, with now dark-reddish slip, stamped by Q. V- C- (AD 115–150, *NoTS 9*, 133–4). Also, form 37 in a dull brown-slipped buff fabric, stamped by Chresimus (AD 125–150, die 4a, *NoTS 3*, 8). Drawn to my attention by Earthworks Ltd from their excavation at *Oakenholt, Flint 2013*.

Cefn caer, Gwynedd (extra-mural area): cup form 27, two sherds considered by the writer likely to be second century Montans ware; pottery unpublished, but see J Evans’ comment in Willis 2005, App 6.8 and Ward’s notes selected by Hopewell (2005, 253, 257): *Cefn caer (Pennal) 2002–3, Trial Trench 1* (19) and *Tr 2* (19), ‘a linear anomaly’ in the vicus east of the fort.

Stockton Heath, Warrington (southern extension of industrial site at Wilderspool): cup form 33, with Q. V- C- stamp, probably die 1f (*NoTS 9*, 2012, 134); Ward 2010, 31, no 10. *Stockton Heath Primary School, 2007* (311).

Stockton Heath: A dish stamped FEL[... If the form was 18/31 as illustrated, rather than 18 as stated, it might be the work of Felicio iv (AD 110–150; *NoTS 4*, 20). *Stockton Heath Primary School, 2007* (26), *fill of ditch* (29). In this enclosure, with pottery generally dated c 120–160, the ditch-fill also included a CG dish, with stamp read in 2014 as C·VC[...] from die 2a of Cuccillus i (AD 145–180; see *NOTS 3*, 215–6). See Ward 2010, 30, 35, stamps 1–2.

Middlewich, Cheshire (extra-mural, industrial site, SE of fort): bowl form Ritterling 12 (cf Martin 1986, fig 3, ‘RI. 12’); chocolate-brown-slipped, pale fabric with no conspicuous inclusions; considered to be Montans ware, and most probably pre-Flavian, whatever its place of origin; Ward 2008d, 124 no 49. *King St 2001, Group 2C* (352) *fill of pit 333*, with another fragment found in *Group 8* (38/39).

Middlewich: cup form 27 with stamp, die 1e of Q. V- C- whose activity was dated c AD 120–130/135 (Dickinson in Williams and Reid 2008, 134), but now AD 115–150 (*NoTS* 9, 133). *King St 2001, Group 8, 38/39*.

Middlewich: moulded bowl form 37, footring resembling form 29, in a dull brownish-slipped pale buff fabric with fingerprints around it; stamped by Chresimus, a neatly detailed impression of die 4a (*NoTS* 3, 8). *Jersey Way, Oxford Archaeology (North) excav 2012, Tr 3 (3335), fill of Roman pit*.

Manchester (extra-mural): flattish-bottomed vessel; brown-slipped, heavily calcareous fabric, stamped by Chresimus, from die 4d, listed as indeterminate form and ‘Manchester (exc 78.2089)’ in *NoTS* 3, 8. *Deansgate 1977, Manchester Univ excav, context 2089 (1a)*. This find complements another Deansgate stamp (from die 4a: RGZM 2003194, a near-complete form 37).

Wigan, Greater Manchester (industrially related site with bath-house and probable military links): likely fragments included cup form 27 in brown-slipped, pale fabric, but see Section 3.2 for a note of reservation. *Grand Arcade, Wigan, OAN excav 2004, post-Roman context (207)*.

Lancaster (extra-mural): moulded bowl form 37 with fragmentary ovolo. *Church St (Mitchells Brewery), Lancaster Univ Archaeol Unit excav 1999–2000, Phase 4 (1257)*. Only one other possible Montans product (form 27) from the 1988/1992 excavation was recorded by Dickinson, from the same OAN post-excavation project.

Carlisle (fort): three plain fragments from suspected second century Montans vessels (Ward 2009a, 541). *Millennium Project, Tr 5: (6660) Period 4A, ‘primary occupation of second fort, AD 105–125’; (2667), Period 5A, ‘near-abandonment of fort, AD 140s–160+?’; (2605), Period 5C, ‘not conventional fort, later second century’*. For phasing, see Howard-Davis 2009, xix.

Carlisle (extra-mural): at least one likely second century Montans cup, *Rickergate, Carlisle Archaeol Unit excav 1998–9, Tr C (236)* and possibly a vessel in (229); Roman material unpublished, but see Newman 2011.

Brougham, Cumbria (extra-mural): dish form 18/31 or 18/31R; brownish-slipped pale fabric, probably late Montans ware and the sole SG product found. *Hackthorpe, Brougham, OAN excav 2007, unstratified*.

Piercebridge, Co Durham (‘vicus’ north of river Tees): form 30, undecorated fragment, taken to be second century Montans ware, but burnt; *Tofts Field 1973 (3020), Phase 2 building constructed c AD 120–150 (Ward 2008a, D9.43.9)*. Dish form 18/31R, likely to be Montans ware; *Tofts Field 1973, Phase 3A (3096), late-Roman context including residual material*.

Scotch Corner, North Yorks: indeterminate sherd in friable yellowish buff fabric with little of a chocolate brown surface surviving. Date uncertain, but perhaps pre-Flavian rather than early second century (*cf* Ward 2013, 85). *OAN, excav 2007, SCA15, fill of ditch 14018*.

Castleford, West Yorks (extra-mural): two moulded bowls were considered possibly second century Montans products: one a burnt fragment from the figured decoration. *Castleford 1987–8, Trench 42 (498)*. A second fragment of figured decoration was found in *Tr 42 (508), 1987–88 excavation by West Yorkshire Archaeological Services (now ASWYAS)*. Unpublished, but see the Barbican Research Associates post-excavation project <http://www.barbicanra.co.uk/section.php?xSec=4>

Little Paxton, Cambridgeshire: two possible Montans dishes of second century origin, in Area A. Only one was tabulated (Evans, Table 4.19, in Ward 2011b, 241). *Little Paxton 92–98, Area A, F128/1259*.

Worcester: form 37, small, messy and dull-slipped. Blurred decoration; identifiable motifs include a split-tongued ovolo as on bowls a) from moulds stamped by Felicio iv and by Malcio i; b) stamped internally after moulding by Chresimus and by Malcio; c) unstamped, at Inveresk (Dickinson 1988, fiche 1:B8, 2.58). A recurring acanthus was probably surmoulage of a Felicio iv type, as on a Wroxeter bowl which showed an internal stamp by Malcio, while a similar basal wreath appears on this and the Worcester bowl (Brenda Dickinson, pers. comm.). *Worcester Magistrates Court 2000, Phase 0 (1003). Archaeological Investigations Ltd; Headland Archaeology post-excav project*.

Worcester: indeterminate fragment in a dull, chocolate brown-slipped, very pale fabric, likely to be Montans ware. As above, *WMC 2000, Phase 2 (2385)*.

5.2 Montans products, with discussion of background

Having been well discussed by Mees (1995, 112–7) and, relating particularly to the first century products, by Martin (eg 1986), the earlier Montans products are mentioned only in passing here, as a consequence of their extreme rarity in (my main focus here) northern Britain (see Willis 2005, 6.6.1; *NoTS* 1, 8). Amongst the first century products from Montans, a stamped vessel was found previously at Castleford fort (Dickinson and Hartley 2000, 11, no 24), one of the very few northern finds to be given a firmly early date (Willis 2005, 6.6.3; Tables 12, 14). In line with Willis’s previous analysis, all but one of the Gazetteer’s northern finds are considered to have come from military or military-related sites. One or two sherds possibly representing first century Montans products were suspected at Chester’s amphitheatre, where pre-Flavian products from La Graufesenque were certainly present. A single sherd from Scotch Corner appears to be the only likely Montans product that was not found at a vicus or military-related site; however, its date and indeed its origin is uncertain. Whatever their precise date, the Scotch Corner and the Piercebridge fragments were found within 6 miles/10 km of the complex at Stanwick, where Willis (2005, 6.6.2) has noted the presence of pre-Flavian Montans ware; between Stanwick

and Scotch Corner lies Melsonby where excavations in the 1990s at an Iron Age and early Roman site produced a significant collection of Neronian samian contemporary with finds from Stanwick in the 1980s (Fitts *et al* 1999). In the North-West, at Middlewich, form Ritterling 12 alone was catalogued as produced in the first century, almost certainly before the Flavian period, probably at Montans. This, too, is a site which has yielded other pre-Flavian samian ware. On the other hand, the Scotch Corner sherd was a fragment on which we should not place too much significance: other samian ware from the excavation was mostly Flavian and indeed included a bowl of form 29, made in the range c AD 60–85. The Montans fragment could otherwise have been a product contemporary with a Hadrianic Lezoux bowl of form 37 related to Potter X-13. Including the single sherd from Scotch Corner and the fragments from Piercebridge, Montans vessels, whatever their date, are catalogued here at only four eastern locations, three of them in the North (the other in Cambridgeshire).

The somewhat more frequent, though still uncommon, products of the earlier second century are found in Britain rather more often than elsewhere outside Aquitaine (see Dannell and Mees this volume). We may presume that in Britain this is not merely a matter of their easier recognition. However, moulded bowls from this later period at Montans tend more recognisably to display poorly moulded decoration (see Simpson 1987) with types copied by surmoulage from earlier examples. Recognisable attributes include a base unlike the usual footring, resembling rather that associated with form 29 or even some dishes, and often with its internal base stamped by the potter. Internal rilling, and internal and/or external grooving at ovolo level, and occasionally an external chamfer below the decoration, are striking features, but ones that were also used elsewhere in South Gaul. These Montans products have mostly been analysed as made in a highly calcareous fabric (*cf* Picon *et al* 1975) and are generally described as pale buff with a dull, brownish slip, or orangey pink with dull, dark red or orangey-red slip, but with variations. It is the stamp that best indicates Montans origin, although even this is not incontrovertible, for stamp impressions vary and some (by Chresimus, for example) are poor.

5.2.1 Distribution

The distribution of Montans vessels catalogued by the writer (Fig 3) now extends a little beyond the concentration of finds in the Chester to Carlisle zone noted by Willis (2005, 6.6.3). The identity of the Gazetteer's scraps from Cefn Caer and Caer Gai was rendered a little more uncertain by their condition, but the Flint stamps in the Gazetteer certainly add to the very few Montans records in Wales: the only Welsh find-spots had appeared to be Carmarthen and, in the north, Caernarfon (see Webster 2003, 218, regarding the potter Q. V- C-). In general,

Montans records occur more commonly immediately east of Wales, at Wroxeter and, particularly, in the Chester and Wilderspool area, reaching also northwards from Manchester to Cumbria's Watercrock, Carlisle and beyond. Less common are finds along Hadrian's Wall and in the East. Eastern records have included in Yorkshire, Brough-on-Humber, Doncaster, Castleford and York (Dickinson 1998, 944) and Binchester, Co Durham (Felicity Wild, pers. comm.). Further south and west, one or two vessels were recorded in the Gazetteer at Worcester, but no examples at Alcester in Warwickshire supplemented the previous significant find of a well-stratified bowl. That bowl, apparently in Malcio i's style, was found in a pit fill dated 145–55 (Hartley *et al* 1994, 106, no 262). Evidence such as this well-stratified find-spot is crucial to dating and adds to finds in London's Second Fire deposits and Antonine Scotland (Hartley 1972, 42–5) in this respect.

Willis (2005, Table 12) had listed Montans ware at 21 military sites which lay mostly in the west of Britain and particularly north-western England, including various find-spots in Carlisle, as well as in Scotland. They were, however, generally rare on Hadrian's Wall, whether stamped or decorated. Birdoswald is since reported to have yielded finds (Willis 2009, 335, 343). Dickinson (2009, 493) noted concerning a bowl from Housesteads fort that Montans finds on the Wall had been increasing, but still scarcely featured there. The only others then known to Dickinson were from Wallsend (3), Stanwix and, as being part of the Hadrian's Wall system, South Shields fort (Hartley and Dickinson 1994, 206). Thus Hartley's summary (1972, 33) of their scarcity on the Wall still holds good, as does his highlighting of the comparative frequency in Scotland of moulded bowls by contemporary CG potters whose work spanned the late Hadrianic and early Antonine periods (potters such as Cettus (known in 1972 as the Small S Potter), and, more conspicuously, the Cerialis ii – Cinnamus ii group, whose bowls seem ubiquitous in contemporary British contexts). Detailed quantification and subsequent research into these distribution patterns with regard to Montans potters and their CG contemporaries would surely be rewarding.

In the east of northern England, Montans finds have previously been recorded at few locations, where Yorkshire finds include items at Catterick (Dickinson and Hartley 2002, 281; counter, in Willis 2005, Appendix 6.8), Castleford, Doncaster and York (two of them in the extra-mural settlement; Dickinson 1998, 948, 956). Of the gazetteer's eastern finds of Montans products in the North, aside from the above-mentioned fragments from Piercebridge and of uncertain date from Scotch Corner, the third location was Castleford vicus. There, one or two fragments were suspected amongst c 1870 unpublished vessels, though being burnt, their origin was uncertain.

In contrast, the concentration of finds in the north-western region between Chester and Carlisle and along

the Antonine Wall is clear (Willis 2005, 6.6.3; see Wild this volume). Largely due to the geographical scatter of samples in the Gazetteer, no Montans products are included further north than Carlisle in the west and (possibly) Piercebridge in the east. Further (suspected) Montans vessels are included from Carlisle fort (Ward 2009a, 541), and at the late Brougham vicus, the sole SG product was an unstratified dish produced most probably at Montans in the earlier second century.

Almost half of the the Gazetteer's Montans records were found in Chester: 16–17 vessels, 9 of them stamped (including one or two possibly first century examples). Moulded bowls have been far less frequently identified in Chester than have stamped plain wares, although (as noted in Section 5.1), decorated fragments may be anticipated amongst the fortress's huge, unpublished assemblages, such as from Abbey Green. In the Gazetteer, only one Montans bowl of form 37 was stamped: this, by Chresimus, was found in the extra-mural locality of the Bars, but lacked its decoration. Found in City Road, a variant of a moulded bowl form 29 and conceivably 29/37, is uncertainly identified, both as to form and place of origin (Lezoux, if it were form 29/37). Excavated again in the eastern canabae, at Priory Place 1989, were 880 samian vessels whose preliminary records revealed several poorly moulded and badly blurred SG bowls which need closer examination before publication. Sherds, for instance, from a badly blurred SG form 37 featuring a griffin displayed a low internal groove, in *Tr 5, Phase 5* (204). Recognition of other, possibly diagnostic features amongst unstamped and decorated or undecorated vessels may bring more Montans bowls to light in Chester: a few more decorated bowls were suspected from first sight of material from excavations of the 1960s–70s. South of Chester across the Dee, some likely second century Montans products were recorded from the settlement at Heronbridge; these were, however, mere fragments, which were found in post-Roman contexts. 'Minority products' would not be unexpected at this settlement: being so close to the fortress, it probably received its samian ware as part of its distribution scheme which is presumed to have been military-related (see Part 2). It may be fortuitous that the writer has as yet noted no Montans products at Chester's legionary depôt at Holt (Ward 1998a; 1998b).

Wilderspool was a military-related industrial site established c 21 miles/34 km north-east of the Chester fortress on the Mersey. Here, Montans products were arriving in relative abundance, as is clear from the stamped or decorated bowls from the 1966–9 excavations (Dickinson and Hartley 1992, 31–2, 36–7), even though full quantification was not given. No report was published on 898 samian sherds mentioned by G Lucas in Rogers and Garner 2007, App 3, 77. However, brief comments which were made in the body of the text (Rogers and Garner 2007, 31, 33, 71) indicate scarcity of any samian

products post-dating those of Domitianic-Trajanic origin in South Gaul. Previous records are supplemented in the Gazetteer by material from Wilderspool's southerly extension at Stockton Heath, which serve to support the previous weight of evidence. Further Montans products were found at another settlement, that at Middlewich on King Street, south-east of the fort at the confluence of the rivers Croco and Dane. Its industrial site is thought to have had strong links with the military and it is considered part of the military-related distribution scheme in north-west England (Ward 2008d, 135). Montans ware was also found further north at yet another industrial site of Walton-le-Dale (form 37; Wild unpublished report), as well as at Kirkham (Mills 2000, 48) and, in the Gazetteer, Lancaster vicus – where, amongst 2169 samian vessels only 1–2 possible Montans products were identified.

A fuller account of moulded and stamped vessels is left to Felicity Wild and her research into northern British finds from Montans (this volume), but here we may consider those potters named in the Gazetteer who worked at Montans. Several bowls in their styles have been found at Wilderspool, but some require re-dating (see Simpson 1987). One potter whose stamps are interpreted as Q. V- C- with his tria nomina has been named Quintus Valerius C- (*NoTS* 9, 133); he was active in the period AD 110–150. He produced only a very limited range of forms comprising cups, mostly of form 27, but they had considerable distribution across Britain, including York, Antonine Scotland, and in western England northwards from Wroxeter fortress to Chester, Wilderspool, Ribchester and, whilst rare on Hadrian's Wall sites, at Watercrock, south of Kendal. Of eight items in the Gazetteer, five were from Chester and the remainder within 22 miles/35 km of it, including Flint, Middlewich and Wilderspool's southerly expansion at Stockton Heath (each of the three considered an industrially – and probably military – related site). Previously at Wilderspool many stamped or decorated Montans products were discovered, seven of them found during the 1966–9 excavations (Dickinson and Hartley 1992, 31–2, 35–7). Quintus Valerius C- was a contemporary of Felicio iv (*NoTS* 4, 20), whose moulded bowls show associations with potters including Chresimus and Malcio. This Felicio's bowls, stamped internally after moulding, occur in the London 'Second Fire' deposits, in Antonine Scotland and in north-western England, (see from Corbridge, one illustrated in near-complete profile (Bishop and Dore 1988, 237–8, no 46)).

For Chresimus, Hartley and Dickinson (*NoTS* 3, 10) summarised their records: 'The most remarkable fact about Chresimus is that over 75% of the stamps recorded above are from Britain'. Working in the period AD 125–150, he made a relative abundance of decorated bowls which appear to have comprised only form 37, and which he stamped internally. His products are frequent in Wroxeter, Caernarfon and the Cheshire area, but also

occur eastwards at York, in the north-west of England at Carlisle and elsewhere. In Antonine Scotland, the Scottish find-spots include Camelon and Inveresk. At the latter they occur in considerable quantity, along with others by Q. V- C- (cf Wild this volume). An increase in published data from Scotland and the north of England and Wales might illuminate any emerging patterns: three Chresimus stamps from Chester published in *NoTS* represent die 4f, while the bowl of form 37 in the Gazetteer was stamped with 4a. Find-spots in the Gazetteer are Chester, Flint, Middlewich, and Manchester (Deansgate). At Manchester other Chresimus stamps are known, both at Deansgate and Barton Street (RGZM 2003194; Dickinson 2007, 72 S4; *NoTS* 3, 8). Also mentioned in the Gazetteer is Florus iv, active 'AD 85–125.' He is known to have migrated, along with his moulds, from La Graufesenque to Montans, but old records of his work tended to be confused: Logirinus's die 2a was mistaken for Florus iv's die 3a (see *NoTS* 4, 95 footnote 3). The potter, Logirinus, was active 'AD 60–90?' and worked at least briefly at Montans, but primarily at La Graufesenque; the Chester stamp recorded by Oswald in 1930 as being Florus and from the civil settlement, is now identified as Logirinus 2a (see *NoTS* 4, 93; *NoTS* 5, 90).

As for Scotland, there being no Montans products noted amongst the few vessels seen by the writer, reference needs making to others' records at many sites including Newstead (eg Hartley 1972, 44). Unfortunately, the recently published reappraisal of the site by Hunter and Keppie (2012) included neither samian ware (cf Hartley 1972, 52–3), nor an overview of the Roman pottery as had been hoped for by Vivien Swan (1999, 450).

At Strageath and Inveresk the abundance of second century Montans ware (Hartley 1972 and 1989, 204–12, 216–8; Dickinson 1988, 165 and fiches) led to discussion of its likely military distribution (Willis 2005, 6.6.6). Hartley's records of stamped and decorated ware (1972, Appendix 1) ranged southwards to Lyne and Newstead, eastwards to Traprain Law, westwards from Cramond along the Antonine Wall, and northwards from Camelon to Ardoch and Strageath. A fuller analysis is again left to Felicity Wild and her research: she has pointed out (2012d; this volume) Hartley's unpublished suggestion that the general distribution implied coastal trading, into London and into ports predominantly up the west side of the country. Her observations on distribution make a strong case for a possible point of entry via the Firth of Forth. Inveresk lies on its south bank, close to the mouth of the river Esk. Material found there is particularly helpful, this being a closely dated site where elements of what is now the largest Scottish assemblage keep on appearing. Steven Willis (pers. comm.) informs us that a small collection was recorded by him across the fort defences area in the 2000–1 excavations by GUARD (Glasgow University Archaeology Unit). Moreover, from

the more recent excavation by CFA Archaeology, Felicity Wild identified a large group of Montans vessels amongst material which was found just north of the fort: the group is considered to have been used and possibly jettisoned on abandonment of the Antonine Wall (for details see Wild this volume). Researchers, conducting standard deviation tests on 'abandonment' deposits elsewhere, will of course consider whether the material was used or unused. They may also ask, as Willis suggests, whether these large stratified deposits of samian discovered at the end of occupation or activity phases at fortresses/forts are the conventionally interpreted dumps of old and/or unwanted items, or whether they represent 'potential termination deposits with a particular symbolic resonance' (Willis 2005, 12.5).

6. Banassac Products

6.1 Banassac products: Gazetteer (Fig 3)

All vessels are likely to have been produced in the first half of the second century; dating is considered in Section 6.2.

Chester fortress

Abbey Green: moulded bowl form 37, brownish red-slipped fabric with conspicuously large calcareous inclusions. Complete profile, with much internal gritting inside the basal floor, but worn from use. Indistinct ovolo (Hofmann 1988, 45, fig 18, D2) and freestyle decoration: large figures above spindles and bifid basal wreath (Hofmann 1988, 58, type D). Bestiarius (Déchelette type 637; O.1105?) opposes bull (O.1871, cf Hofmann type 234); boar (O.1670); bird (O.2248? cf Hofmann type 289) and lions, Hofmann types 182 (O.1420) and 183. The bull and spindles occur on a Banassac bowl from York, in Sheffield Museum (Brenda Dickinson, pers. comm.). For similar composition, see Hofmann 1988, pl 17.139, BIRAGIL[LVS] with ovolo D1 (the distinction between potters Biragillus i–iii is unclear; see *NoTS* 2, 79ff). *CHE/AG 1975–8 mostly Defences area: (1), topsoil; Tr 1 (65) medieval context; Tr 2 (84), fourth century material on rampart; Tr 2 (149), later-Roman build-up in Defences area; Tr 1 (153), amongst Antonine to 3rd-c material from rampart, redeposited; Roman Defences area Tr 2 (195), deposit in Civil War ditch.*

Abbey Green: form 37 in poor brownish-slipped, pinkish fabric with conspicuous calcareous inclusions. Indistinct long-tongued ovolo with indeterminate tip (rosette?); indistinct border above cone, tendril and rosettes. Hartley from personal inspection in 1978 considered the decoration and ware indicative of a Banassac product. *AG 1975–8 Tr 6 (379), road between centurions' quarters, with Saxon disturbance* (for site-phasing see S. Ward *et al* 1994).

Abbey Green: form 37 in a fabric similar to Banassac products but ovolo not shown on Hofmann 1988, 45,

fig 18; *cf*, however, his pl 20.152. *AG 1975–8 Tr 1* (9), *post-medieval context*.

Chester, extra-mural locations

Amphitheatre: form 37 with heavily calcareous red fabric, blurred ovolo with narrow core and scarcely distinguishable tongue. *AMP 2004–06, Tr A, u/s*.

Amphitheatre: form 37, with calcareous fabric and fragmentary ovolo, perhaps Hofmann 1988, 45, fig 18, ovolo R. *AMP 1960; GM Winsford store; SJH box 6 6/7*. Recorded by Heidi Archer, Aug 2013.

Amphitheatre: form 37 with calcareous fabric and fragmentary ovolo, perhaps Hofmann 1988, 45, fig 18, ovolo T1. *AMP 1929–31; GM Winsford store, VII* (29). Recorded by Heidi Archer, August 2013.

East of the fortress

Eastgate St: form 37 with bright red gloss on hard, red fabric with conspicuous calcareous inclusions and one long, thick chalky streak. Decoration included hound (O.1936? *cf* Hofmann 1988, 146 no 176) and festoons (see Ward 1995, 40–1 no 4); the bowl's smudged basal wreath comprised spikey rosettes with a central hollow (*cf* Walke and Walke 1968, Taf 31.11), not plain discs as illustrated. Made from a mould produced at La Graufesenque before c AD 90, but which had evidently been heavily used by the time this bowl was produced. Hartley from personal inspection considered its general appearance and ware likely to indicate a product of Banassac, where Germanus and moulds moved in the period 'AD 90–130?' (*NoTS* 4, 196). *EGS 1990, taberna, Phase 3b* (77), *mid-second to late Roman dump*.

South of the fortress

Lower Bridge St: form 37 with red fabric with conspicuous calcareous inclusions. Ovolo blurred unrecognisably, above freestyle animals including boar O.1671, bird O.2248 and stylised trees; *cf* *AG 1975–8, SF* 3160, above. Hartley in 1978 considered this probably a Banassac bowl, though perhaps from a La Graufesenque mould (Bulmer 1979/80, 57, fig 31; Bulmer 1980b, fig 41 no 303). *76 LBS 1976, unphased group*.

Elsewhere

Middlewich (extra-mural, industrial site): form 37, being a large bowl in red-slipped ware with densely packed, calcareous inclusions and poorly moulded decoration. Blurred ovolo with indistinct tongue (Hofmann type W rather than D2, perhaps). Divided panels with dog and female, O.927A (possibly O.927A, but lacking at least a forearm) in an arcade with decorative columns as used at Montans, left of spear-like plants (*cf* Hofmann type 382) and a bestiarius (Hofmann type 415) facing a boar (Hofmann type 237?) (Ward 2008d, 129 no 72). *King St 2001, Group 8, 38/39*.

Middlewich, as above: base, perhaps form 30, in a red-slipped, hard red fabric with conspicuously large calcareous inclusions; this cannot be identified firmly

as Banassac ware, but fabric details were similar to the previous record. *Jersey Way 2012, OAN excavation, Tr 3* (3090), *Roman deposit*.

Middlewich: bowl form 30, and as on the Chester Eastgate St 1990 bowl, a similar, but much longer chalky streak circumscribed the interior of the footring, but this piece lacked decoration and was of uncertain origin. *Jersey Way 2012, Tr 3* (3310), *Roman pit fill*.

Middlewich: form 37 whereon a blurred stag reclines between Germanus-type trees in which sits an indistinct bird as on Hofmann 1988, pl 16.125, at Banassac; it is unclear whether this bowl was produced there or at La Graufesenque (Ward 2009b, no 11). *Community Dig 2005, Buckley's Field, 0.4 km SE of fort; Tr 12, Phase 7u* (1220); worn footring found in *Phase 9m* (1217).

Lancaster (extra-mural): form 37 with matt brownish red slip on a heavily yellow-flecked, red fabric. Panelling with gladiators, *cf* Hofmann 1988, 142 types 80–81, pl 6 no 47, though the figures are duplicated and superimposed almost unrecognisably. A vertical border adorned with a looping motif is again duplicated and superimposed on a gladiator. *Church St, LUAU excav 1999–2000, Phase 2Bi* (4180).

Previously in 1988/1992, *Phase 2b*, Dickinson recorded a possible Banassac bowl, form 37, with zonal decoration and characteristic chamfering below it (Hartley nd, disc 2, Lancaster_06, D15, *context 829/11982*). *OAN post-excav project*.

Carlisle (fort): form 37 in a red ware with regular and conspicuous calcareous inclusions, from Banassac; grooved internally above the decoration. Ovolo recorded previously at Old Penrith (Dickinson 1991, 120, fig 53.72). *Millennium Project, MIL5 9995, unstratified*. No details published, but this was one of several putative Banassac fragments recovered (Ward 2009a, 541).

Castleford, West Yorks (extra-mural): a few fragments possibly represent Banassac vessels: one from form 37 in a fabric with conspicuous calcareous inclusions, displays perhaps Hofmann 1988, 45, fig 18, ovolo X. *Castleford vicus, 1987–8 WYAS excavation, Tr 42* (1). One cup of form 27 likely to be early second century was made in a similar fabric, but fabric-appearance alone does not prove a Banassac origin. *Castleford vicus, 1987–8 WYAS excavation, Tr 51* (784). Unpublished, but see Barbican RA post-excavation project <http://www.barbicanra.co.uk/section.php?xSec=4s>

6.2 Banassac products, with discussion of background

Relatively common in Upper Germany and the Danube provinces, Banassac products were catalogued through the 20th century by such scholars as Knorr, Karnitsch and, currently, Gabler, and were the subject of surveys by Rogers (1969–70) and Hofmann (1986; 1988). They have been discussed more recently by Mees (1994; 1995, 101–12), Polak (2000, 27–30), Gabler *et al* (2009)

and Delage (eg (2012, 89–91). With all this continental research, chronology is becoming clearer: its products are known to have appeared on the Rhine and Danube at some point between AD 90 and 120, and distribution continued there through the first half of the second century (Mees 1994, 33; Delage 2012, 90). Products of *Natalis i*, for instance (RZM 0006081-3), have good dating evidence in Upper Germany at sites such as Gauting (Walke and Walke 1968) and on the Danube, often in good Hadrianic groups. Gabler (1993, 121–2) noted them in the Heddernheim Erdkastell, said to be disused from AD 110, and also with good (Hadrianic) coin-dated evidence at Zalalövö. Those products bearing Hofmann's 'teardrop' ovolo A, associated with *Germanus i* (RGZM 0006063, ovolo 000115 when accessed in December 2014), were most probably produced after 130 (Mees 1994, 33–5, 37). In addition, the influence of Lezoux's *Cinnamus*-style decoration on Banassac (Rogers 1969–70; eg RGZM 0006100) can have been no earlier than AD 135 and more likely from the 140s. In the case of Britain, Hopkins asks 'Is this a member of the *Cinnamus* group moving south, or just straightforward 'plagiarism' by the Banassac potters, having lost 'inspiration' due to the cessation of exports by their counterparts at La Graufesenque?' (2012, 193).

The fabric of Banassac products has long been considered indistinguishable from that of La Graufesenque even by spectrographic analysis (Picon *et al* 1975, 194; Delage 2012, 89–90). However, sherds identified as Banassac products from their decoration or from stamps often appear to contain in their fabric large, yellow-white calcareous inclusions (see Delage 2012, 89), greatly conspicuous to the unaided eye, so much so that experts including Hartley have felt able to identify them with some degree of probability. For the rest of us, subjective observations may not be so reliable. Most plain sherds are not included in the Gazetteer or on Fig 3, though they have been recorded in the excavation archives as suspected Banassac products. In the case of form 37, Banassac bowls sometimes show a strongly marked chamfer below the decoration that might be deemed characteristic, if not diagnostic. Again, however, such chamfers can feature elsewhere (see bowl of uncertain origin from Chester's amphitheatre from *Phase 6, construction of seating bank*, 2612). As for their decoration, recognition can be clouded by factors noted above, as in the complication that some moulds from La Graufesenque were used at Banassac, while some potters themselves moved there (Hartley 1977; *NoTS*, *passim*).

In Britain, however uncommon and uncommonly recognized they may have been, some moulded bowls from Banassac were identified previously: Hofmann 1988, 19 had listed stamped finds only from Caerleon, Wroxeter, Margidunum and Newstead. Willis (2005, App 6.1) added various find-spots, mostly for moulded bowls and stamped vessels, including Gadebridge Park, Herts, Colchester and Heybridge, Essex, and Alcester in Warwickshire. In the

North, he noted finds at Carlisle, Old Penrith, York, and Holt, Chester's legionary depôt. These, and some others, should be recalled or brought to attention here.

In the West, at Alcester, two bowls of form 37 were recorded previously (Hartley *et al* 1994, 96, no 61; 100, no 203), one said possibly to be in the style of the *Natalis* group including an ovolo 'with a tongue too large in proportion', and another with straight-tongued ovolo as found at Gauting (Walke and Walke 1968, Taf 33.17). However, no likely Banassac products were seen by the present writer amongst the more recently examined assemblages. Other excavations in Alcester may reveal further examples, however. South-west at Gloucester, another bowl probably in *Natalis*-style was found during the Defences excavation, in Phase A4.4. This was comparable with the Gauting bowls and the straight-tongued ovolo was found also at Ovilava (Wels, Austria); see Wild 1986, 57, fig 27.2. Further west again, in Caerleon's canabae was found a decorated bowl with the 'tear-drop' ovolo A (Hartley 2000, 181, 191, no 169).

In the East Colchester's finds have included one or two bowls (Dannell 1999, 21), with Hofmann's 'tear-drop' ovolo, type A. In East Anglia a bowl of form 37 from Caistor St Edmund was ascribed to 'the style of *Natalis* or one of his close associates' (Hartley in Frere 1971, 25 fig 10.1). In the East Midlands, at Littleborough, Notts, there were 'a couple of sherds of Banassac ware' (Hartley and Dickinson 1995, 267). Several items arrived northwards in Yorkshire: the Gazetteer includes a decorated bowl fragment from Castleford vicus. Another bowl might have been suspected at Darrington Quarry, only a few miles to its south-west (and even closer to Pontefract, itself a site yielding samian including Antonine CG products). However, this find is in no respect reliable evidence: it was a base, lacking decoration; Banassac fabrics are reputedly indistinguishable *per se*, and the writer has seen insufficient samples from Espalion and Le Rozier to be sure of its 'minority' origin.

Extra-mural finds at York itself previously included a bowl from the colonia showing Hofmann's ovolo A (Hartley and Dickinson 1990, 277 no 886), and a possible example from Swinegate, which lacked identifiable figure-types (Dickinson 1998, 944), while another bowl from York, shows a scene with large animals (housed in Sheffield Museum; Brenda Dickinson, pers. comm.). Healam Bridge lies on Dere Street, south of Catterick (Bishop 2005, 216, fig 40). A late-looking bowl of form 37 was represented in two contexts in the site's earliest excavation phase in 2012 (Monteil forthcoming). With both ovolo and decoration indistinct and seemingly removed from the mould while still wet, Monteil observed similar basal wreaths on La Graufesenque bowls, but found these S-shapes with similar spacing on a signed bowl at Banassac. At Catterick to its north, were found moulded bowls and a stamped cup (Dickinson and Hartley 2002, 432 nos 168–9, 434 no 186, 439 stamp

12, all from Bainesse, and at Catterick Bridge 463–4 no 12, with Hofmann ovolo A).

As for the work of specific potters, the stamped cup of form 33a, from Catterick Bainesse was clearly a Banassac product, made as it was by Geamilus i (*NoTS* 4, 150, die 3a), one whose production was limited and was exclusively at Banassac, in the period AD 100–140. Concerning Germanus i, Hartley and Dickinson state ‘The study of this potter’s career is too large a topic for this volume’ and, in brief, consider that he was active AD 65–90 at La Graufesenque and in the same period perhaps at Le Rozier, followed by Banassac ‘90–130?’ (*NoTS* 4, 196). He produced no stamped plain ware at Banassac, but the decorated bowls found there were made in Banassac moulds. The related ‘SER’, a potter working at La Graufesenque and Banassac and discussed previously by Hartley (1977, 253), was active ‘70–130?’ and possibly took his only die, together with Germanus i’s dies, to Banassac (*NoTS* 4, 196; see for instance, a bowl from Salzburg, Mees 1995, Taf. 232.4). Another potter, Flavius Germanus (L. Flavius Germanus) was active AD 85–120 at La Graufesenque, and also at Banassac, where his dies not necessarily continue in use later than his others (*NoTS* 4, 76). However, his accredited Banassac dies are not so far those noted amongst his stamps at find-spots in Britain, which include Chester fortress, the settlement south of the Dee at Heronbridge and the legionary depôt at Holt.

Known examples in Britain of dies which were used at some point at Banassac suggest sporadic distribution of its products, occasionally reaching the North and West. So rarely are they found there that this Gazetteer has recorded none. In the absence of an overview of British finds, attention may be drawn here to a few potters whose work is known and/or may be looked for elsewhere, conceivably in the North. Banassac products, particularly moulded bowls, by Natalis i may be surmised in Britain, although his specifically Banassac dies have not as yet appeared north of Verulamium. Having worked at La Graufesenque and apparently moving to Banassac, probably in the 90s, he is said to have been ‘the earliest or one of the earliest potters active there’, working till ‘140?’ (*NoTS* 6, 219). At Verulamium, one of his moulded bowls (form 29, die 5a; *NoTS* 6, 218), may have been produced from a La Graufesenque mould and, this being a form used there until its decline or perhaps cessation c AD 90, the bowl could represent his earliest work at Banassac. There is also, as Dannell (2012, 58) pointed out, ‘the vexed question of the life of moulds’ and this might argue for Banassac’s later production of bowls of form 29 than we would normally anticipate.

It is presumably random results of sampling that stamps of such potters as Natalis i and Suarad, are not as yet recorded further north: Suarad, active AD 120–160 (*NoTS* 8, 359), is another Banassac potter represented only as far ‘north’ as Caerleon, Margidunum

and Wroxeter. Differential distribution is apparent in the case of the Banassac potter now known as Amando: an unusually large proportion of his stamped vessels reached Britain. In London, for instance, five of his cups of form 33 are listed. However, as Hartley and Dickinson state, the absolute quantity is too small for a sound judgment and the London examples may have arrived in a single batch. While his activity is datable only broadly as ‘first half of the second century’, another of his form 33 cups is known at Wallsend and there, although circular reasoning might be problematic, it was presumed to be Hadrianic dating evidence (*NoTS* 1, 168). Coccillus i is another represented in the North; one of Hartley’s ‘wandering potters’ (1977), it is uncertain whether the man himself worked at Banassac. At any rate his die 5a was used there (as well as at Lezoux and possibly Vichy), and its Banassac presence is said possibly to belong to the same, late, phase as the use there of early Antonine figure types from Lezoux: his general activity is dated AD 140–170 (see *NoTS* 3, 72). Die 5a occurs on plain ware at Cirencester and London, but also in North Yorkshire at Malton and in Scotland at Newstead (along with some possible decorated bowls, lacking stamps; Hofmann 1988, 19), but fabric details are not known to this writer.

In northern and western Britain unnamed Banassac bowls are recorded sporadically, as at Ribchester vicus (eg Wild 1988, 24 no 57), Old Penrith (Dickinson 1991, 120, fig 53.72), Lancaster and Carlisle: these last two locations will be found to be supplemented by the Gazetteer’s Lancaster and Carlisle fort bowls. The Gazetteer contains few entries, but several more might be suspected, as at Middlewich (Ward 2008d, 137) and in Wales, where some vessels, including Caer Gai’s in the Gazetteer (see below), would benefit from re-examination. Previously published material has included Carmarthen’s, where at least some of Boon’s ‘Biragillus-style’ sherds will have been late La Graufesenque, rather than Banassac, products as presented (Boon 1978, 85–97); however, this potter and/or his moulds did arrive at Banassac; *NoTS* 2, 78–9. Further north, at Caerhun, a bowl suggested as ‘probably Banassac’ (Baillie-Reynolds 1931, 283, S.96) was certainly a late SG, and poorly moulded, erotic bowl, although the figures are not illustrated amongst Hofmann 1988s types. Banassac ware was also proposed at Brithdir, near Dolgellau (Boon 1978, 52 no 27), but that bowl warrants re-inspection, being possibly important evidence at this fortlet with no evidence of occupation beyond AD 110–130 (Hopewell in Burnham and Davies 2010, 292). At Prestatyn, at least one bowl (Ward 1989, 149 no 66 and fig 76) needs checking for possible Banassac origin with its unrecognisably poor ovolo and an indistinct erotic group, Oswald 1936–7, pl xc, A or Hofmann 1988, 145 type 145, used on Germanus’s Banassac-made bowls as found at Bregenz (RGZM 0006029 and 0006020).

At Chester, more Banassac products may well be recognised after proper examination of material

excavated in the 1960s and 70s: preliminary inspection revealed several decorated sherds of late origin whether at Banassac, Montans or La Graufesenque. Other vessels noted in old excavation reports (as at Heronbridge; Hartley 1952, 14; Hartley and Kaine 1954, 27, 29) were clearly of late origin in South Gaul, but would require closer examination. Unusually crammed decoration on a bowl from the Deanery Field included a 'bull wearing a girdle', said to be Germanus-related (Newstead and Droop 1931, 117 on pl 41.6). Of two bowls from Foregate St (Newstead 1939, pl 19, nos 35, 39), the technique of one was described as exceedingly poor and its badly blurred motifs were similar to those recorded at Abbey Green and Lower Bridge St in the Gazetteer. Whilst at Montans there was a general tendency for second century potters to rely on surmoulage for their decorative motifs, at Banassac the practice was also known (Rogers 1969–70). However, not all Banassac bowls were (and therefore are not described in British reports as being) poorly moulded, especially when the original modelling was good. Boon (1967, 34) pointed out that the 'teardrop', or indeed acorn-like, ovolo type A was originally highly detailed, 'toothed in the upper lobe' (RGZM 0006033).

If Banassac fabrics are indeed indistinguishable from other SG wares, then how can we ascertain the origin of bowls with an unidentifiable ovolo, as noted above at Prestatyn? In the case of illustrated bowls such as one from Chester's legionary depôt at Holt (Grimes 1930, fig 48, no 142), with its unclear ovolo, wreath and its late SG, possibly Germanus-type pendant, and its possibly Banassac-type animals, personal inspection might reveal more than the indistinctly illustrated ovolo. Attention has previously been drawn (Dannell 1999, 16, no 50) to another bowl from Holt, which, with a vegetal clump as on a bowl from Colchester, on closer inspection of its ovolo might prove to be a Banassac product (see Grimes 1930, fig 37, no 40; cf Willis 2005, App 6.1). Publication of rubbings at a scale of 1:1 rather than drawings would help towards resolving at least some such problems.

The quantities of Banassac imports found in northern Britain (if not Britain as a whole) are too small to be statistically meaningful. However, we can at least conclude that all those recorded in the Gazetteer were found at military-related sites and all but one was found west of the Pennines: the only certain exception (another, a plain base at Darrington Quarry, being of uncertain origin) was at Castleford (Fig 3).

7. Finds of Uncertain Origin (Fig 3)

Chester, extra-mural

Amphitheatre: Orangey red slip, orangey fabric with few inclusions and of unusual fracture; if SG, then perhaps a Lot Valley product. There is a strong chamfer below the decoration, characteristic of bowls produced at Banassac, but also occurring elsewhere in South Gaul. However,

the fabric has little calcareous content and resembles rather some products of Les Martres-de-Veyre and an early workshop in East Gaul is feasible. Panels, one with large arrowheads; one to right, with unrecognisable blobs (at least one was a rosette); cf Banassac: Hartley *et al* 1994, 100 no 203. *AMP 2004–06, Tr B, Phase 6, 2612, construction of seating bank.*

Amphitheatre: form 37 with a hard red fabric containing conspicuous large calcareous inclusions; probably a late La Graufesenque export, but its decoration is badly blurred and identification is uncertain; ovolo with smudged, spikey tip; rather than Hofmann 1988, 45, fig 18, ovolo V, cf RGZM ovolo 000058 (when accessed March 2015), its shorter tongue could be explained by type 000058 having an applied tip. Below, is a coarse and irregular wavy-line border and unidentified figure. An untidy ornamental arrangement appears to be astragaloid, which would be abnormal for Banassac. *AMP 2004–06, Tr C, 3044, post-medieval Phase 15.*

George St, north of fortress: form 37 being a thin-walled bowl in a good, red fabric with calcareous inclusions; thought to be Banassac ware. Blurred decoration: probably Hofmann 1988, 45, fig 18, ovolo D3 above wavy line border and V-shaped ornament, but again unusually composed of astragali (as from *AMP 2004–06, Tr C, 3044*), belonging to a larger design, possibly reticulate, as used at Banassac, although astragaloid here. *George St, 2001, Liverpool Museums excavation, Tr 3 (22).*

Foregate St, east of fortress: form 37 with an unusual and very distinctive rim in a dull-slipped, heavily yellow-flecked buff fabric. Top of ovolo trimmed off, but probably a degenerated impression of Atkinson 1914, pl 7.38 (RGZM 2003010), badly blurred on this bowl. Zonal decoration with four wreaths and indistinct animal frieze including dog (O.2015?), boar (O.1671?) and composite grass plants. The mould will have been an earlier, Flavian product at La Graufesenque, but had been much-used when this bowl was produced at a workshop that is as yet unidentified. *FGS 1998, Tr 1 (21)*, 15 fragments; another in *Tr 1 (210)*.

Elsewhere

Caer Gai, Gwynedd (extra-mural): one or two bowls of form 37 may represent later production at La Graufesenque or Montans, the two finds being in the vicus east of the fort in *Tr 1, Phase 2 (5)* and *(8)*, both linear anomalies and the latter possibly a path from a small building. Another, abraded and eroded fragment of panelled decoration (so indistinctly moulded as to be unidentifiable) may have been a Banassac product; *Tr 1, Phase 2 (8)*, as above. Pottery unpublished, but for a note on the samian dating see Hopewell 2005, 262.

Middlewich (industrial site): form 37, being a shallow bowl with unworn foot in a pale, heavily calcareous fabric with dull, brown-red slip. Decoration

badly blurred, probably in removal from the mould: unidentified ovolo with squarish egg and rosette-tipped tongue; festoons with bird (O.2266) above a wreath of trifid leaf and buds. General appearance might have supported a Hadrianic origin at Montans (Ward 2008d, 125; 154 fig 86 no 55). Such festoon friezes occurred there (Simpson 1976, 258 no 15), but were frequent also at La Graufesenque, Banassac and Espalion (Tilhard and Bouquillon 2009, pl 11.650), along with the basal wreath (Tilhard and Bouquillon 2009, pl 12.472; cf Mees 1995, Taf 251, nos 1, 3 and 5). *King St 2001* (325), fill of 'linear feature' 324.

Wigan, Greater Manchester (industrially related site, probably with military links): form 37 in eroded orange-buff fabric with dark reddish slip, badly abraded. Ovolo as used by T. Flavius Secundus (Vernhet and Vertet 1976, 30.13; Mees 1995, Taf 180.6); for the latter, from Dover, see RGZM 2006518, ovolo type 000132 when accessed in March 2015. This potter worked in the wide range AD 80–120 at La Graufesenque and Montans (*NoTS* 4, 81), and some of his La Graufesenque work was considered very late (Mees 1995, 94–5). Below, decoration included a mastiff-like dog (cf O.1994) and composite grass-plant (cf Hermet 1934, pl.62, A6, with similar dog). The fabric is unusual, but may be thought more likely a late (Trajanic?) product of La Graufesenque, rather than Montans ware. *The Wiend, Wigan, Greater Manchester Archaeol Unit excav 1983, Phase 2, W4* (353); *OAN post-excav project*.

Darrington, West Yorks (settlement): form 37 with no surviving decoration, produced in or before the early decades of the second century. Red ware with conspicuously large calcareous inclusions: possibly, but in no way certainly, made at Banassac. If significant, the hard red fabric and its calcitic content could suggest, if not the Lot Valley, then Les Martres-de-Veyre, rather than early East Gaul (Heiligenberg). *Darrington Quarry north extension 2011, ASWYAS excavation, (705)*; pottery unpublished, but see excavation summary in grey literature; Roberts 2011. This little-worn footring was found associated with a mid- to late Antonine bowl, though Hadrianic-early Antonine CG plain ware was also found nearby.

Notes

Note 1. Although erring on the large side, maximum numbers provide a more realistically intelligible means of comparison between samian groups than do sherd counts, weights, minimum numbers or estimated vessel equivalents, aka EVEs (Ward 2012, 22–3). Sherd counts and weights are too imprecise; minimum numbers are misleading in large collections and EVEs are still rarely used in samian reports and are therefore difficult to compare across the decades of samian studies. Moreover, being based on rim or base sherds, EVEs would render

comparison of these 'minority products' impossible, inasmuch as most of the fragmentary instances lack those parts.

Note 2. The common usage of '24/25' adopted by Oswald and Pryce (1920, 171), seems originally to have indicated the alternative forms of this rouletted cup, Drag. 24 being the standard and 25 its variation with small spiral 'handles' (Dragendorff 1895, 86; Taf 1). The spiral, more characteristic of the Augustan-Tiberian prototype, appears only occasionally on samian vessels and the writer has seen no handled examples in northern England. Distinction between fragments is impossible without the survival of handles, but most examples in Britain will have represented form 24. It appears that the type, like marbled ware, had a differing distribution, being produced and marketed in Southern Gaul long after exportation to Britain ceased. Dannell (2012, 66) notes that the form's production had waned by c 70, although finds still occur at both Corbridge and Rottweil in Flavian contexts and also in the Cala Culip IV wreck. The Cala Culip representation indeed was far greater than normal, amounting to 14.2% of the plain samian, whilst the samian evidence as a whole (Nieto and Puig 2001, 32) suggests that the wreck occurred most probably between 78 and 82.

Note 3. RCHM 1962, pl 31 and p 63. Monaghan (1998, 948) noted RCHM 1962, 63 as probably an antiquarian discard, but RCHM give no indication that it is other than a site-find. Peter Webster informs that its provenance was said to be Monument 48, building debris including material from workshops on the site of the present Railway Station and just west of it: 'Structural evidence of kilns and workshops is still lacking but pottery making and the manufacture of small ornaments here are indicated by the finds'; another mould fragment in the Yorkshire Museum seems to have been acquired in 1891. The other site-finds, including bits from jet and bone working, indicate workshops and a pottery mould would seem in keeping.

Note 4. Not considered as such are *fabricae* in forts or small scale industrial activity in vici. At those industrial establishments with apparent military links, including recently excavated sites at Middlewich, Holditch and Wigan (several having bath-house complexes), changes were clearly afoot around the mid-second century (cf Garner and Reid 2009; Ward 2011a, 85–7).

Note 5. Of the Piercebridge stamps, 34 were found c 1 mile/2 km from Manfield village during the Holme House excavations: two at the villa, 1969–70 and 32 at the southern settlement and the bridge abutment, 1971–2 (Cool and Mason 2008). Published in *NoTS* vols 1–9 as 'Holme House, villa, Mansfield' [sic], the provenance of the late CG stamps is given below as Holme House, Piercebridge; none was from the villa.

Note 6. Although Gueugnon fabrics were unexamined at the time of discussion in 2008 (*NoTS* 3, 359), Eppillus was one known to stamp plain ware at both Gueugnon and

Lezoux, and we can note his die 4a on a vessel from Paris in a fabric that ‘is a pale sandy brown with orange-brown slip and does not look like normal CG ware’ (*NoTS* 3, 359 footnote 5). His signed 37 at Papcastle (Wild 2012a, 218 no 3) was made in ‘an orangey fabric with a matt, highly micaceous orange slip, not dissimilar to the fabric produced at Lezoux in the 1st and early 2nd centuries’. Notet (2012) records several potters’ names common to Lezoux and Gueugnon and more than one potter who stamped pots using the same die at both potteries (see Review of Notet 2012 by Symonds, this volume).

Note 7. See Ferdiere and Gendron 1986; Delage 1997; 2000; and Delage *et al* 2012. Hopkins (2012, 193) noted ‘Centre-ouest’ decorative elements, though not style, as being reminiscent of Trajanic and Hadrianic period Lezoux and Les Martres-de-Veyre poinçons. Its crudely rouletted examples of form 37 and of form 30 variants (eg Delage 2000, fig 37.10) should also be borne in mind when checking British finds.

Note 8. Senicio was a potter active AD 30–65, *NoTS* 8, 209, but in this context the vessel was probably produced later in that range. Listed in *NoTS* 8, 206 as die 5b, on form 24 from Chester fortress ‘A6 75 V 660’, this was Abbey Green Tr V, and context 660 was a pebble floor in one (early post-Roman?) building; its form, however, requires re-examination, as this complete footring was catalogued in the site archive as form 27. It was associated with exclusively Roman finds, but they included a repaired Lezoux bowl of later-Hadrianic to early-Antonine origin.

Note 9. A striking instance was excavated in 2008 from a Roman pit fill at the ‘industrial site’ at Jersey Way, Middlewich, on King Street: a little-used bowl of form 29, almost complete in profile but lacking a basal stamp, was a very early find for this region, being a product no later than Neronian (OAN projects). For views on the chronology of King Street and its sites see Wild 2002 and for a summary, see Carrington 2012, 413.

Appendix 1: ‘Marbled’ ware

‘Marbled’ ware was produced in Southern Gaul at La Graufesenque and Le Rozier (on the technique see Picon 1998 and Sciau *et al* in Genin 2007, 23). Using a special clay for the yellow colouring said to have come from Vignes in the Tarn valley near Le Rozier (Picon 1998, 53–6), this ware was sold primarily to the Mediterranean market and is rare north of the Alps (for discussion see Genin 2007, 155–61; Mees 2012, 47–8; Dannell and Mees 2013, 169–71). Along with the evidence of southern England and with two Midlands’ plain ware stamps in *NoTS*, namely two dishes from Mancetter(?) and Leicester (Castus i, *NoTS* 2, 272, AD 40–70; Maponus, *NoTS* 5, 257, AD 60–85), at least six marbled vessels have now been published from York, at least one stamped (Dickinson and Hartley 1993, 757; Dickinson 1998, 949;

NoTS 7, 167–9, on dish form 18 by Ponteiuis, AD 70–95). Production was at its height from the Claudian period into the early Flavian period (see Mees 2012, 47–8). So too was that of the rouletted cup forms 24 and/or 25 (see Note 2), which were frequent in marbled ware and will also be noted (in Part 2) from early Lezoux.

Although production of marbled products (and indeed of form 24) extended into the Trajanic period (Genin 2007, 161, 163), their exportation to Britain may have ceased in the later 70s rather than the early 80s. This chronology may be reflected in the absence of marbled ware from Cala Culip IV. Further, we may note that a report of a ‘marbled Drag. 43 bowl’ appears anomalous amongst the SG ware recorded from Varignano villa in Liguria (Bertino 2013, 281). At any rate, marbled vessels are extremely rare finds in northern Britain (Bulmer 1979/1980, 43) and they do not occur in this Gazetteer since the writer has seen nothing further to add in the intervening decades. Dannell and Mees (2013, 169–71) have argued the case for the relatively restricted output of marbled ware being less likely to reflect cost alone, rather than consumer preference, as the arbiter of demand.

Appendix 2: L. Cosius – second century production at La Graufesenque

British examples of named work (all signed) by L. Cosius seem virtually confined to the West, including Exeter and various locations in Wales. Exceptions known to the writer are three locations in North Yorkshire. This unusual pattern of distribution therefore warrants our consideration of his work.

L. Cosius, cognomen unknown, was a potter who signed freehand in block capitals in the decoration of the moulds (MS1; *NoTS* 3, 129). When not signed, his bowls are often recognised by his distinctive ovolo, the ubiquitous type which will be noted on bowls below, where its tongue’s rosette-tip had degenerated into a large blob (RGZM ovolo 000124’ when accessed in March 2015).

For the start of his career, the absence of form 29 suggested the late beginning ascribed to his work (AD 90–125; *NoTS* 3, 129). Evidence of his latest work has been found outside Britain. This comprises those unusual versions of bowl form 37, naming the death-scene of DECIBALV[S] at the end of the Dacian Wars. Given Trajan’s titles as including Parthicus, they could not have been made before AD 116 (see Vernhet 1981, 34; Mees 1995, 59, 74; Polak 2000, 51; Rusu-Bolindet 2008). Hartley and Dickinson (*NoTS* 3, 129) have dated his activity AD 90–125, but questioned whether many such products were exported beyond Southern Gaul; Britain’s lack of them has been taken to suggest not.

The more common examples of his signed form 37, whatever their production date, are recorded from such sites as Caerleon, Cardiff and Carmarthen in South Wales

(*NoTS* 3, 129). Four are listed from Chester, three from the early 20th century extra-mural excavations (*NoTS* 3, 129). One of them, found in 1914, was recorded in Brian Hartley's hand-written notes in the Grosvenor Museum archive as 'Foregate St, Co-op; 77M' (Hayter 1925, 10, no 4; see Mees 1995, Taf. 30, 7 and RGZM 0004459). Two other signed bowls (*NoTS* 2, 129) were from the Regal Theatre, Love St; see Newstead 1939, 98 and pl 29, nos 8, and (a sherd showing only the potter's signature, but in full) 8a. The former, no 8, was accompanied by sherds with the usual ovolo and compartmental decoration, illustrated by Mees as 8a (1995, Taf 28.6; RGZM 0004450). The fourth of Chester's signed bowls was found in the fortress at Abbey Green 1975, in a post-medieval context, Tr 6 95; it displays an animal, clump and tree as on a bowl from Lower Bridge St (Bulmer 1980b, 72 no 302, unillustrated). Another, unsigned bowl in his style, with a triple arcade was found recently at Gorse Stacks (Wild 2012c, 32, D7, dated AD 100–120). His signed bowls found further north than Chester include a badly made panelled bowl at Ribchester showing Diana (Dickinson 2000, 209–10, D20) but in general such finds are few; see *NoTS* 3, 129, MS1.

On stamp evidence the British distribution for L. Cosius seems strangely skewed to the west of the province. In North Yorkshire, however, his signed bowls include one at mid-Pennine Bainbridge and another at York (a panelled bowl with parallels at the Saalburg; Dickinson 1998, 956). Another signed bowl, showing animal decoration, was found recently at Healam Bridge during the 2012 excavations on the A1(M) where a late SG bowl was also suspected (Monteil forthcoming). Further south in Yorkshire, the Herculean Labours were depicted on an unsigned bowl in this potter's style, at Castleford vicus (Dickinson and Hartley 2000, 74–5, no 1029). Whilst Hercules was favoured by Flavian potters including Crucuro i, perhaps in arena re-enactment scenes (Bird 2012, 146) such as are known in the Severan age (Coleman 1990, 60), L. Cosius also inscribed 'Acta Erculentis' on his work (eg RGZM 2002742a–c). Bird notes, however, that he tended to depict the Labours in a more traditional (mythological) way. We may further observe that according to Pliny the Younger, Trajan's actions as a general under Domitian were comparable with the Herculean Labours and, moreover, Hercules was hailed as *Victor* during Trajan's reign (Hekster 2005, 203–4). Decebalus' death in 103 and Trajan's Parthian victory were celebrated in triumph in 106. The opportunistic and politically astute L. Cosius appears to have jumped on the imperial bandwagon in celebrating Trajan's triumph and his identification with Hercules (Rusu-Bolindet 2008, 345). British examples of suspected scenes from this potter's Herculean repertoire warrant publication.

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Late Montans decorated samian ware from Scotland and North-West England

Felicity C. Wild

1. Introduction

It was during the preparation of his article 'The Roman occupations of Scotland: the evidence of samian ware' (Hartley 1972) that the late Brian Hartley realised that an appreciable quantity of late South Gaulish ware came from sites in Scotland with no evidence for first century occupation, including those on the Antonine Wall, and that this must, consequently, be assigned to the Antonine period. Most, if not all, of this material is likely to have originated from Montans. He had clearly hoped to include full publication of both the stamps and decorated ware in his original article, but this would have necessitated further work on both the British and French finds and was put off for a future occasion which, alas, never materialised.

The present article is intended, to some extent, to remedy this deficiency with regard to the decorated ware. The list of decorated sherds from Scotland left by Hartley in his Appendix 1 forms its basis, together with more recent finds excavated over the past forty years (Figure 1 shows the sites from where such items have been documented). Hartley had clearly intended to broaden his study to include other finds of this material from Britain and France. Full treatment of all the finds from Britain has not been possible here, but two groups from North-West England have been included, from Wilderspool and Manchester, which provide important parallels to the Scottish collection. Wilderspool has produced an unusually large group of late Montans decorated ware. Some has already been published (Simpson 1987; Dickinson and Hartley 1992), but since then the advent of computer technology and the ability to scan rubbings has allowed the detail of the decoration to be presented far more accurately than in drawings, justifying the republication of the pieces here. The group from Manchester is unpublished.

The Scottish material, from Antonine sites producing

no standard Flavian-Trajanic decorated ware (with the single exception of Newstead), is crucial to the dating of the late Montans potters. The dating of the north-western sites is looser: Wilderspool appears to have been founded *c* AD 90–100 and Manchester by *c* AD 80. Both have produced standard South Gaulish wares from La Graufesenque datable to the period *c* AD 90–110. However, the close similarity of the Montans products to those from Scotland strongly suggests that most, if not all, of the pieces published here arrived during the Hadrianic-early Antonine period.

2. Characteristics of Late Montans Ware

The class of pottery discussed here is only found in western Gaul and Britain. To quote Hartley (unpublished draft):

'As far as Britain is concerned, it includes decorated bowls of form 29/37 and 37 and the plain forms 18 or 18/31, 18R, 18/31R, 27, 33, 35, 36, 46 and Curle 15. These all differ somewhat from the normal first-century South Gaulish forms, though they retain some features of them, such as a groove around the footring on form 27 (not invariably present), or an external groove below the lip on form 33, sometimes combined with internal moulding at the junction of base and wall. Dishes, especially of the 18–18/31 series, are sometimes rather smaller than normal South Gaulish ones and often have a flat base with nearly vertical, squarish footrings rather than ones with triangular sections. The same treatment is also found sometimes with cups of forms 27 (usually with very flattened profile) and 33. Another difference from normal practice is the habit of using name-stamps on the bases of forms 35, 36, 46 and Curle 15 instead of leaving them unstamped or

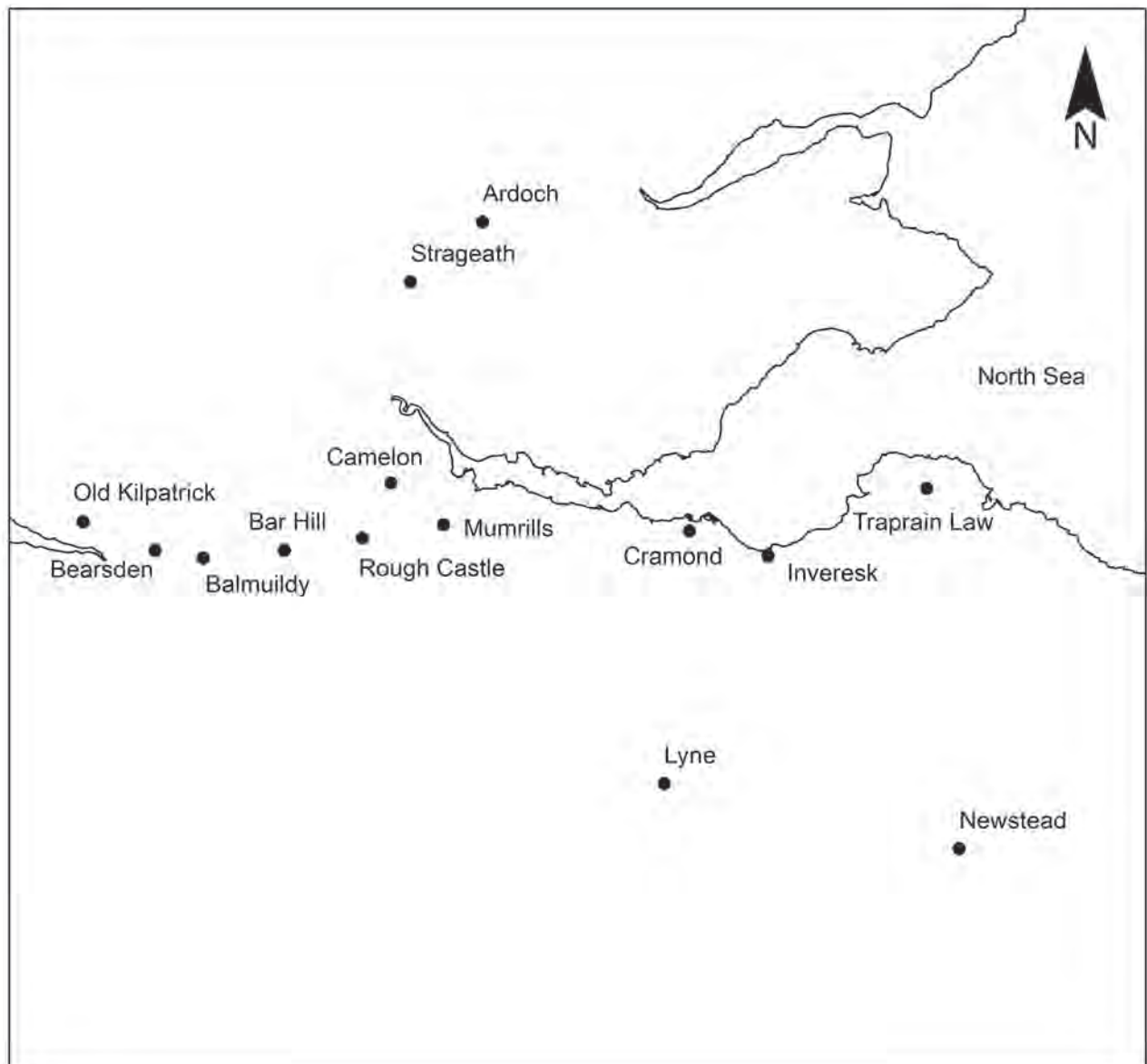


Fig 1. Sites in Scotland where examples of Montans ware have been recorded

stamping with rosettes. Most interesting of all is the use of the footring normally confined to form 29 on bowls of form 37, and the presence of potters' stamps on the inside of the bases, another link with form 29. These two features have led to frequent misidentification of fragmentary bowls as form 29.

It is notoriously difficult to generalize about the fabric colours of samian ware with any accuracy, but it may be worth noting that there is a tendency for these vessels to be in a light fabric, ranging from a colour close to putty to a light orangey buff. The glazes are often patchy and usually dull brown, though orangey brown or reddish brown ones are known. Some of the wasters preserved at the Musée Saint-Raymond at Toulouse have a high gloss approaching that of the better products

of La Graufesenque, but this has not been observed on site-finds and is presumably due to over-firing.'

The decorated bowls illustrated here are all of form 37 apart from one form 29 variant from Inveresk (no 14 below). There are a number of distinctive features which occur on some, but not all of the bowls. These include a double groove on the interior of the bowl at roughly the level of the ovolo, of the type normally associated with form 30. This is sometimes accompanied by fine grooving on the interior of the bowl as a whole. Shallow grooves or fluting may also appear on the outside of the bowl above the ovolo. While in some cases this may imply no more than careless finishing of the rim (as on no 19), in most it was a deliberate decorative feature. Below the decoration there is often a slight chamfer, presumably caused during

the finishing of the footring. As noted above, the footring may be more similar to that associated with form 29, with a gentle quarter-round moulding ending in an offset on the underside and an internal potter's stamp.

The decoration of late Montans bowls tends to be badly produced and poorly moulded. Many of the figure types are copied from those of La Graufesenque by *surmoulage*, leading to a reduction in size and a blurring of detail, though some of the types not recorded in Oswald (1936–7) or Déchelette (1904) may have been original. Where Oswald numbers have been cited in the catalogue below, it should be assumed that the types are reduced in size. The poor quality of the decoration is likely to have been due as much to poor mould-making as to poor potting (Burroughes 2012 and pers. comm.). If the decoration is too deeply impressed into the mould, the potter will need to press the clay hard into the mould to obtain a satisfactory impression. Insufficient pressure will lead to blurring and lack of detail. A deeper pattern will also take longer to dry and shrink, and will be more difficult to remove from the mould without damage. A classic example of this is no 20, from Inveresk, where the clay has been well pressed into the bottom of the mould, leaving a firm impression of the lower part of the decoration, while the upper part is so faint as to be barely visible. This makes identification difficult, particularly of the ovolo. There is also some movement in the pattern, as can be seen in the legs of the figures, due to sideways pressure causing movement of the clay in the mould. No 28, from Lyne, is little better.

3. The Potters

The stamps of three Montans potters have been recorded from Scotland: Chresimus, Felicio iv and a potter stamping Q.V.C. Of these, only Chresimus and Felicio iv produced decorated bowls. It should be noted that in older reports Felicio appears as Felicio iii. It was only during the later stages of the preparation of *Names on Terra Sigillata* that Hartley and Dickinson realised that the Felicio stamps from Montans were likely to belong to two different potters, one at work in the period c AD 60–80, the other in the second century AD. The second century potter was reclassified as Felicio iv.

Other potters with close associations with these producers and overlapping working lives are Attillus, L.S. Cre- (not thought to be the same as Chresimus), Florus iv and Malcio i. Chresimus was clearly a potter, not a mould-maker, in that all his bowls are internally stamped. Felicio iv stamped some moulds early in his career, but the majority of his bowls are internally stamped, including all those described and illustrated here. The potters mentioned above clearly worked together as a group, sharing moulds and reproducing ovolos and *poinçons*. Felicio, Chresimus and their anonymous mould-makers

are likely to have been the latest members of the group, the earliest being Florus iv (c AD 85–125) who started work at La Graufesenque before moving to Montans, and Attillus, whose main period of production for decorated ware appears to have been c AD 80–110 (Jacques and Martin 1997, 71). At Montans, a bowl from one of Attillus' moulds was stamped L.[] Cre- (Simpson 1976, 261) and a bowl from one of Malcio's moulds by Felicio (Martin 1986, 65, fig 7). Links between the potters in their use of ovolos are noted below.

From the apparent length of Attillus' career, Jacques and Martin (1997, 71) suggest that there were two potters of that name working at Montans, Attillus I (c AD 80–110) responsible for the decorated ware and Attillus II, a Hadrianic-early Antonine potter, producing cups and dishes of forms 46 and Curle 15. Hartley and Dickinson (2008–12) follow this division, with their Attillus iv (c AD 65–110?) and Attillus viii (c AD 120–150). Maybe, in view of the influence he had on the material from Scotland, the later decorated ware should be reassigned to Attillus viii. Jacques and Martin appear slightly undecided as to whether they were correct in assigning it to the earlier potter (1997, 72). However, in view of the fact that his ovolos, and no doubt other details as well, appear to have been copied over and over again by his anonymous successors, his influence clearly lived on, and the matter must remain unresolved. For this reason references to Attillus here do not include the potter number unless the piece is stamped with a die noted in Hartley and Dickinson 2008–12.

Of the decorated bowls listed here only four are stamped, two by Felicio iv (nos 7 and 46) and two by Chresimus (nos 32 and 47). Of these two are from Scotland, no 7 from Camelon and no 32 from Newstead. The other two are from Manchester.

4. The Ovolos (Fig 2)

All the ovolos listed below are associated with the group of potters discussed above and all except ovolo 7 (a and b) occur on the sherds from Scotland published below. Ovolo 7 does not occur in Scotland, even in its degenerate form, 7b, suggesting that it may have gone out of use before AD 140. Stamped bowls have the die numbers noted after the potter's name, referring to the illustration of the stamp in Hartley and Dickinson 2008–12.

1a. A single-bordered ovolo with a straight split tongue attached to the right of the core. Used on bowls stamped by Malcio i (RGZM 2003189 from Montans, die 1c), Chresimus (RGZM 2003194 from Manchester, no 47 below, die 4a), and Felicio iv (Martin and Triste 1997, 131, fig 8, 22, from Vannes, die 2h).

1b. A degenerate form of 1a, often blurred and with the split less visible (e.g. nos 21, 51 below). The tip of the right-hand portion of the tongue turns slightly to the

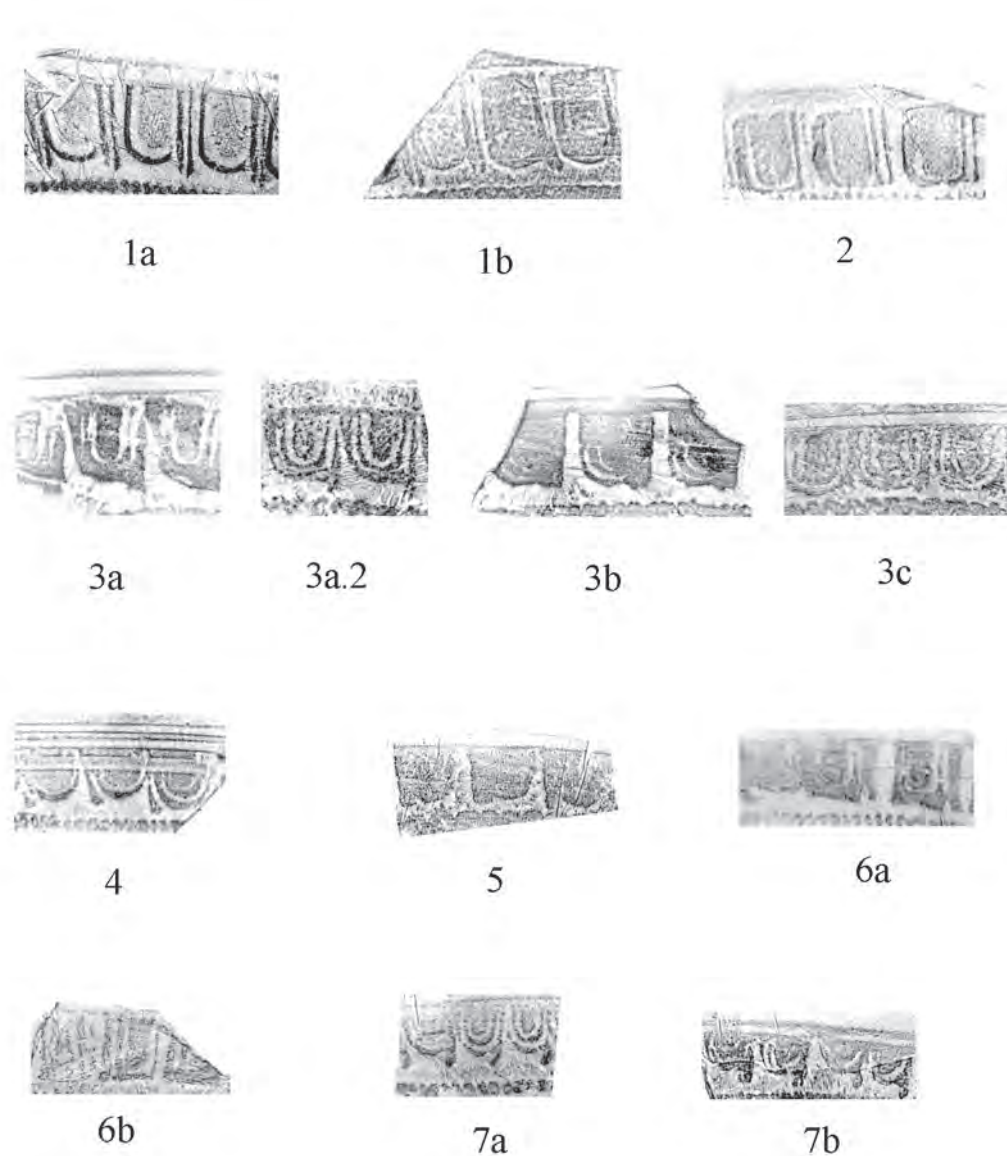


Fig 2. Ovolos on late Montans decorated ware. Scale 1:1

right. This, too, was used on bowls stamped by Chresimus (RGZM 2003195 from York, die 5a).

2. A squarish, single-bordered ovolo with straight tongue to right, which also appears to be split, but which, unlike ovolos 1a and 1b, ends level with the lower edge of the core. Used by Felicio iv (RGZM 2003196 from London, die 2a, stamped in the mould).

3a. A double-bordered ovolo with straight-ended tongue to right. The impressions are stamped crookedly and the left side of the core flares slightly towards the top. Used on a bowl from Richborough (RGZM 2003201; Bushe-Fox 1932, pl XXX, 1) stamped internally by Attillus (Attillus iv, die 1a), and on no 18 from Inveresk. Ovolo 3a.2, Simpson's ovolo 3 (1976, 260) which she describes as a double-bordered ovolo on which the tongue

forms the right-hand side with a loop at the bottom, is likely to be this ovolo, though the loop does not always show. It can be seen on the clearest impressions on no 29 from Mumrills and no 53 from Wilderspool.

3b. A double-bordered ovolo of similar size to 3a, with tongue to right, but more regularly spaced. The detail is generally blurred. It occurs on the bowl from Strageath (no 41 below), where Hartley equates it with 3a (1989, 216, D34), and on the bowl from Inveresk (no 23) from the same mould as one from Newstead stamped internally by Chresimus (no 32, die 54g). Both versions of the ovolo, 3a and 3b, occur in the same group at Inveresk, suggesting that both must have been in use at the same time.

3c. Another probable variation of the same ovolo, on bowls from Old Kilpatrick (no 39) and Inveresk (no 25).

It is similar in size and general character to 3a and 3b, though more closely spaced. The clearest impressions appear to show a trident tongue. Possibly the same as that which occurs on a bowl from London attributed to Attillus (GH 1929.50, ex Guildhall Museum).

4. A small double-bordered ovolo with tongue to left, sloping towards the core. Used on a bowl stamped by Chresimus from Bordeaux (RGZM 2003063, die 5a). On nos 19 and possibly 20 from Inveresk and no 56 from Wilderspool.

5. A small double-bordered ovolo with tongue to left, of a similar size to ovolo 4, on an unstamped bowl from Kenchester (RGZM 20003200). On bowls from Inveresk (no 24) and Old Kilpatrick (no 38). The detail is generally blurred. Possibly a version of ovolo 4 (see no 56 below).

6a. A squarish, single-bordered ovolo with a straight-bottomed core and tongue to right, similar in character to ovolo 2, but smaller. On no 33, from Old Kilpatrick, which shows similarities to the work of Felicio iv. The detail is not clear enough to be certain of its exact form.

6b. A squarish, straight-bottomed ovolo of the same size as 6a, but with tongue to left. On no 11, from Cramond, in Felicio iv style.

7a. A small double-bordered ovolo with narrow tongue attached to the right-hand side of the core, with tip turned to left beneath it. It was used on bowls from Montans by the Flavian-Trajanic potter Nomus ii (RGZM 2003187, die 2b) by Attillus iv (RGZM 2003192, die 1b), by Malcio i on a bowl from Périgueux (RGZM 2003190, die 3a) and on a bowl stamped by Felicio iv from Corbridge (exc. 80NE, die 5a). Despite its wide use, this ovolo does not appear in Scotland or in groups of similar date and is likely to have gone out of use before AD 140.

7b. A degenerate or rather blurred version of ovolo 7a, used on a bowl from London stamped internally by Felicio iv (RGZM 2003191, die 1a). The ovolo does not appear in Scotland or on any of the pieces published here.

5. The Decoration

As at other factories of the late first to early second century AD, the largest number of bowls show panel decoration. At Montans these are demarcated with coarse wavy lines or bead rows (it is often difficult to tell which) and contain figure types, generally based on those from La Graufesenque reduced by *surmoulage*. Possible original types include the woman at altar (nos 15, 23, 58), a group of two women with a child (no 28) and another group of uncertain nature (nos 23, 32). One (at least) of the mould-makers using the split-tongued ovolo 1 had a small triple bud which he used as a mask at the junctions of the panels. This is usually blurred and appears simply as a triangle, but the clearest impressions, as on no 31 from Newstead, make it clear that it is, in fact, a bud. Other bowls sometimes show double or multiple bead row borders, as on no 4 from Balmuildy and no 41

from Strageath, both with ovolo 3b. The curious bowl from Old Kilpatrick, no 38, appears to be decorated with little other than bead rows. Basal wreaths are a common feature of the majority of bowls, particularly of chevrons, in a wide variety of sizes and styles.

Leaf scrolls are not uncommon as a decorative scheme, as on no 25 from Inveresk, as are horizontal bands of decoration, as on no 29 from Mumrills. Other bowls may be termed 'freestyle', as no 15 from Inveresk, in that the decoration lacks vertical divisions into panels.

6. Trading and Distribution

Apart from distribution in western France, export of late Montans ware appears to have taken place exclusively to Britain. Its distribution across Britain appears uneven. An accurate distribution map of its occurrence across the whole country is impracticable, as much remains unpublished and the results of new excavations can significantly alter the picture. The map (Fig 3) shows the distribution of stamps and decorated ware currently recorded from the Dee and Humber northwards. With the possible exception of sherds recorded by Dickinson (2009, 488) where the form was not noted, plain ware identified on fabric alone has been omitted.

The distribution of Montans wares, from their earliest import, suggests coastal trading. Of the potters mentioned in this article, it is notable that stamps of the earlier members of the group occur only in the south of Britain. Stamps of Florus iv have been recorded from Clausentum (Southampton) and Richborough, those of Malcio i from London and Richborough, and of L.S. Cres- and the Attili (iv and viii) from Richborough alone (Hartley and Dickinson 2008–12). Import by sea along the South Coast and into the Thames Estuary had clearly started in the first century AD and continued into the second.

By the second century there is, as well, evidence for trading up the west side of Britain, with finds recorded from sites in South Wales and Caernarvon, a group from Wroxeter, and a heavy concentration in the North-West (*cf* Ward this volume). The concentration at Wilderspool seems to imply import into the Mersey Estuary, from where, no doubt, wares travelled inland to Manchester, and possibly down to Wroxeter, with odd sherds also recorded from Middlewich and Nantwich. There appears to be less evidence for import into the Dee. Stamps of Chresimus and Q.V.C. are known from Chester, but apparently little decorated ware. It seems curious, if the wares were arriving at its port, that the settlement of the highest status in the area should not have been consuming the most prestigious ware, while the lesser settlement of Wilderspool has produced so much. At least nine pieces have been recorded from Ribchester (Dickinson 2000, 204) and one from Walton-le-Dale (unpublished), possibly suggesting import into the Ribble, with a scattering of pieces from other north-western

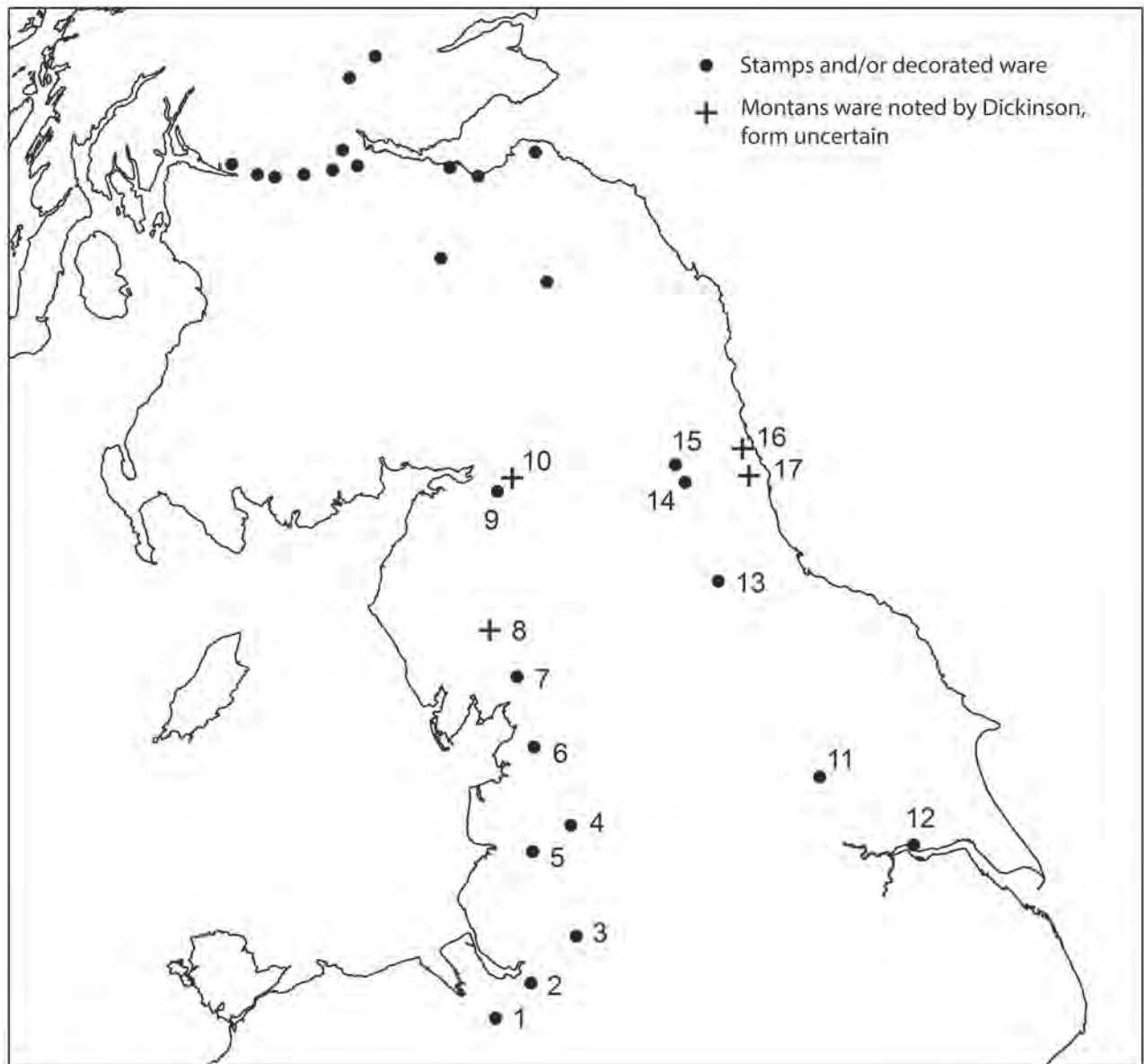


Fig 3. The distribution of late Montans ware in northern Britain; 1: Chester, 2: Wilderspool, 3: Manchester, 4: Ribchester, 5: Walton-le-Dale, 6: Lancaster, 7: Watercrock, 8: Ambleside, 9: Carlisle, 10: Stanwix, 11: York, 12: Brough-on-Humber, 13: Binchester, 14: Corbridge, 15: Housesteads, 16: Wallsend, 17: South Shields, Scottish sites as on Figure 1

sites, as far as Carlisle. By comparison, the occurrence at sites in the north-east of the country is sparse, with little occurring along Hadrian's Wall, though Dickinson records its presence at Housesteads, Wallsend and South Shields, as well as Stanwix (Dickinson 2009, 488).

The other major concentration lies in Scotland. The large quantity of decorated ware recently excavated at Inveresk (Wild forthcoming) now strongly suggests import up the east side of the country and into the Firth of Forth, for distribution to sites along the Antonine Wall, where it reached Mumrills, Rough Castle, Bar Hill, Balmuildy, Bearsden and Old Kilpatrick, and to other forts in the east of Scotland: Camelon, Ardoch and Strageath to the north, Cramond, Newstead and Lyne to

the south. A stamped dish (form 18) of Chresimus also reached Traprain Law. Whether it also came into the Clyde is a moot point. Old Kilpatrick, at its west end, has produced one of the larger groups from the Antonine Wall, but none has been recorded at any of the forts on the west side of Scotland between there and Carlisle. The piece tentatively noted by Hartley from Castledykes (no 45) is in fact from Les Martres-de-Veyre.

7. Catalogue of the Decorated Ware

In the following catalogue the Scottish sites are arranged in alphabetical order, as in the appendix to Hartley's article (1972, 43–5), followed by the material from

Manchester and Wilderspool. From sites where a number of bowls have been found, small and badly abraded sherds adding little to the decoration have been omitted. Each entry is followed by the Museum or excavation number and published reference, where applicable. All are from form 37 except no 14.

Abbreviations

GLAHM: Hunterian Museum, University of Glasgow
 NMS: National Museum of Scotland, Edinburgh
 O.: Oswald 1936–7
 WAGMG: Warrington Art Gallery and Museum
 RGZM: Serial number on the website of the Römisch-Germanisches Zentralmuseum, Mainz

7.1 Scotland

Ardoch

1. Ovolo 1b, with triangular bud motif across the border junction. Panels show the warrior O.992 and Victory O.814. (NMS FQ 89).

2. Basal wreath of chevrons, as on the Camelon bowl stamped by Felicio iv (no 7). The decoration, badly blurred, shows uprights ending in a ring and in a fishtail similar to that on no 35 from Old Kilpatrick, though the chevron wreath points in the opposite direction. (NMS FQ 96).

3. Bifid basal wreath and small animal. (NMS FQ 83).

Balmuldy

4. Seven sherds of the same bowl, with chamfer beneath the decoration removing the edge of the basal wreath. Ovolo 3b. Panels with double bead-row vertical borders, containing Victory O.817, spearman, hound over lion O.1370A in festoon and an uncertain figure. The hound occurs on a bowl from Newstead (no 31) with the split-tongued ovolo 1a. The basal wreath of vertical grass tufts is probably the same as the wreath on the bowl from Mumrills (no 29), and similar to the basal wreath from Rough Castle (no 40). (GLAHM F.1922.266; Miller 1922, pl 34, 37–9, 46, 53).

5. Three sherds in all, two joining. Panels with single bead-row borders containing the same spearman as no 4 over four circles and panther to left looking backwards O.1573A. (GLAHM F.1922.282/3; Miller 1922, pl 33, 33–4, pl 34, 35).

6. Lower part of the decoration with small figure and Victory O.814. The small figure appears on an Inveresk bowl with ovolo 1b (no 21). The types occur together on a bowl stamped by Felicio iv in the British Museum (unnumbered). (GLAHM F.1922.293/1; Miller 1922, pl 35, 62).

Bearsden

In the forthcoming report on the excavations, three pieces of Montans form 37 are mentioned, one of which shows

decoration of satyrs, one with grapes, the other with a hare (Dickinson forthcoming). The two types feature regularly on the Scottish bowls, the satyr with grapes O.597 on nos 22 from Inveresk, 41 from Strageath and a sherd from Cramond (Dickinson 2003, fig 46, 10), the satyr with hare O.602 on nos 26 from Inveresk and 38 from Old Kilpatrick. Unfortunately it has not been possible to obtain rubbings.

Camelon

7. Lower part of bowl with a distinct facet below the decoration and a 29-style base with internal stamp of Felicio iv (die 2g). Decoration includes the legs of a spearman to left O.1102, a figure to right, incomplete animal types, a pedestal and S motifs over a basal wreath of chevrons as on no 2 above. (NMS FX 107).

8. Two joining sherds of a small bowl with external grooves above the ovolo and internal grooves below the rim. Decoration shows a row of cupids O.435 beneath arcades containing rosettes. The cupid, arcade and rosette occur on a bowl from Wilderspool (no 56). The ovolo replacement consists of tips of a vertical plant motif alternating with rosettes, the full version of which occurs as a basal wreath on another bowl from Wilderspool (no 60) and on bowls from York (unpublished) and Wroxeter (Bushe-Fox 1916, pl 26, 2), both stamped by Chresimus. (NMS FX 73, 88; Anderson 1900–1, 382, fig 11).

9. Ovolo 2, above a triple medallion containing a hare O.2105. An identical medallion with hare occurs on a bowl from Manchester stamped by Felicio iv (no 46). The hare also occurs on a bowl with ovolo 1a stamped by Malcio i in Lectoure Museum (RGZM 2003193; Simpson 1976, fig 4, 11). (Falkirk Museum; Hartley and Dickinson forthcoming).

Cramond

10. Small sherd with acanthus and spiral. The acanthus is on a bowl stamped by Felicio iv from London (RGZM 2003196) with larger spirals. Similar spirals occur on a bowl from Wilderspool with the split-tongued ovolo 1a (no 55 below). (Edinburgh City Museum; Hartley 1974, 204, fig 17, 24).

11. Ovolo 6b. A large spiral and standard motif, paralleled on the Felicio iv bowl from London (RGZM 2003196), S motif as on no 7 and leaf frond. Identical decoration occurs on an unpublished sherd from Exeter (RS 77 988). The frond is also on a bowl from Wroxeter with ovolo 2 (Wild 1997, fig 365, 1). (Edinburgh City Museum; Dickinson 2003, 42, fig 46, 1).

Two other sherds feature in Dickinson's report (2003, fig 46, 2 and 10), the latter showing the satyr O.597 in an arcade with striated column.

Inveresk

12. Panels with gladiator, probably O.1008, as on no 24, and arcade with man O.635, surrounded by horizontal

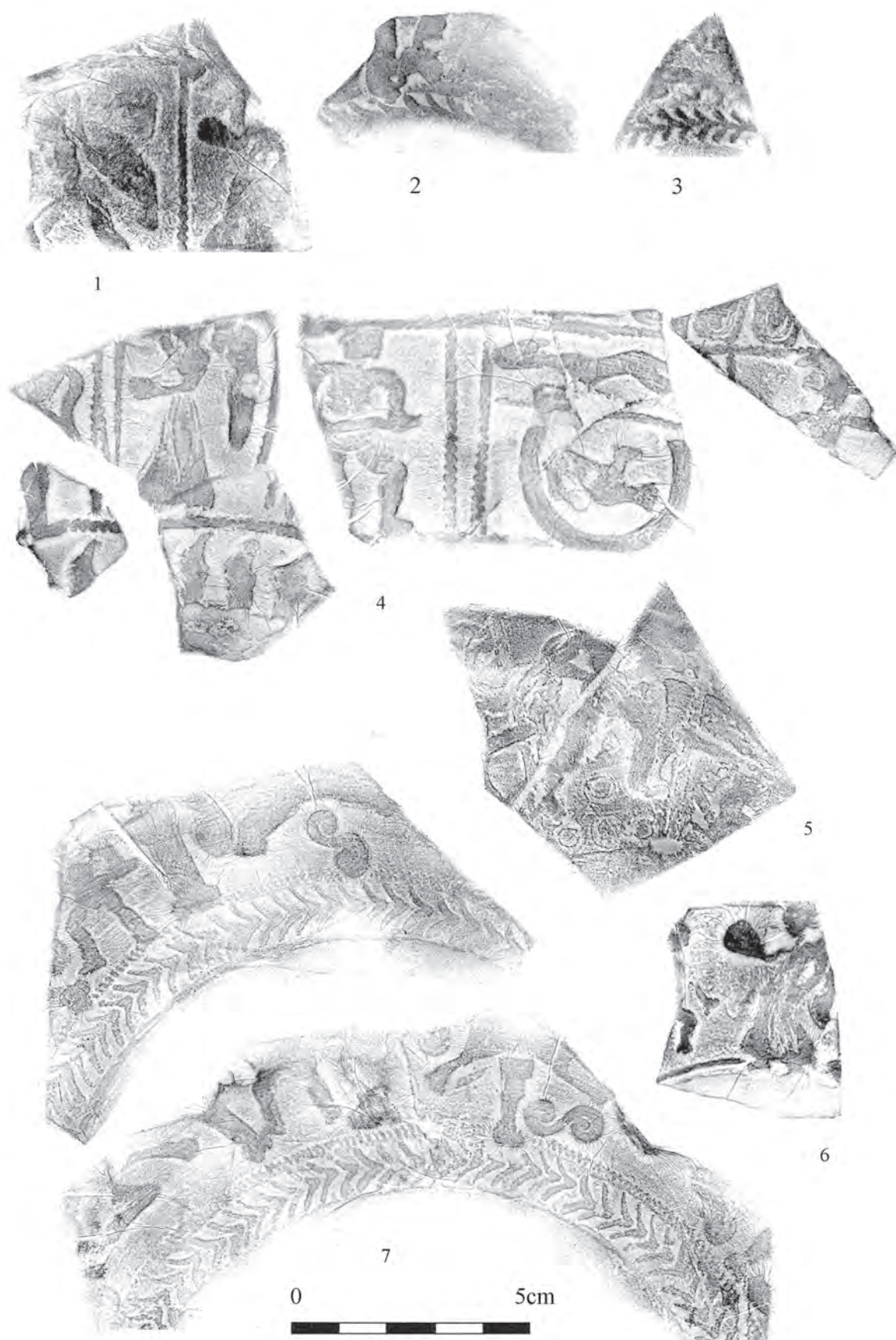


Fig 4. Montans ware from Scotland: Ardoch 1–3, Balmuildy 4–6, Camelon 7

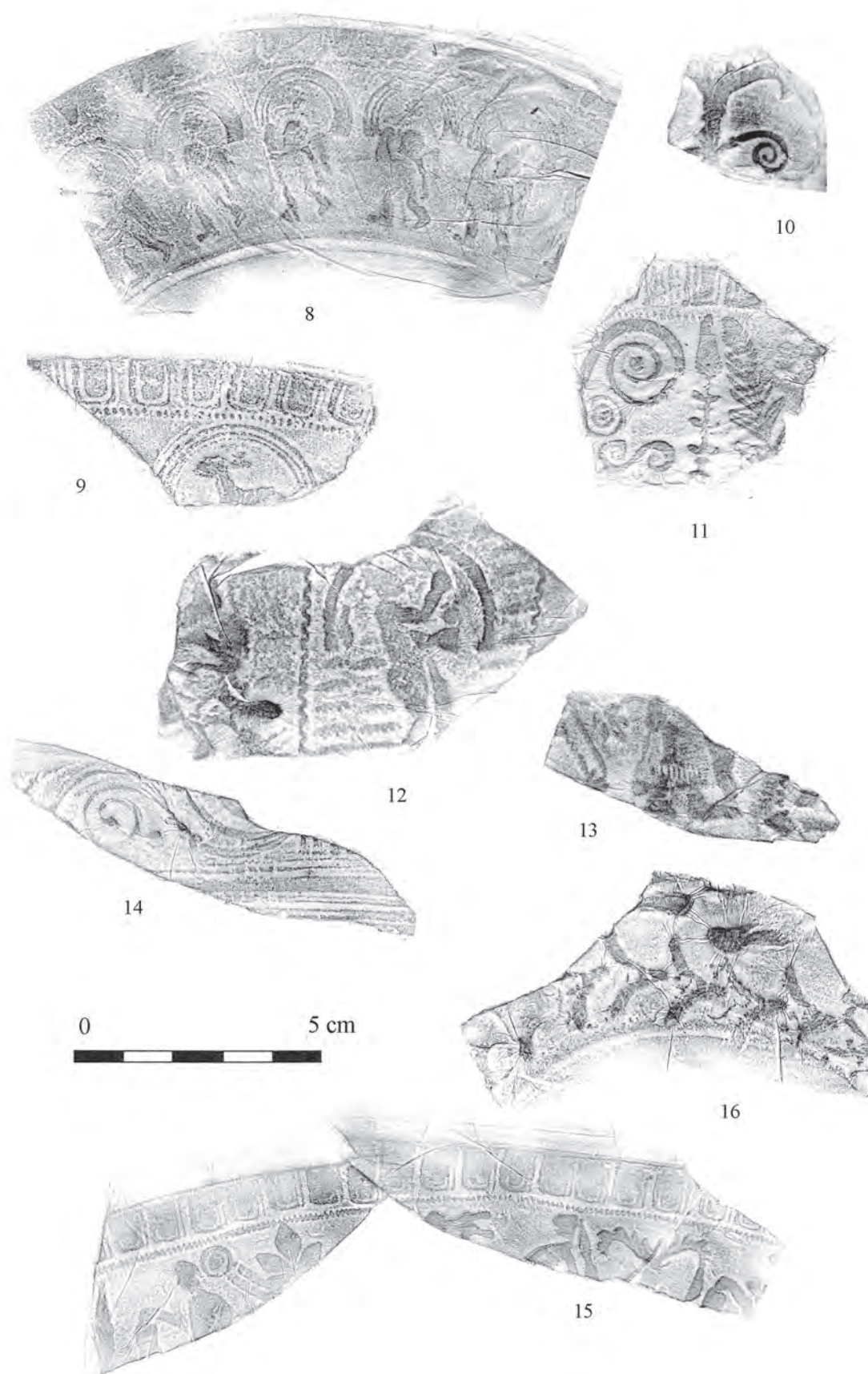


Fig 5. Montans ware from Scotland: Camelon 8–9, Cramond 10–11, Inveresk, 12–16

impressions of a corded spindle. The man and arcade occur on the bowl from Manchester with stamp of Chresimus (no 47; RGZM 2003194), with vertical impressions of a similar spindle. (NMS).

13. Panel with corner tendril ending in a group of buds, Diana with hind O.104B and triangular junction motif. The type and motifs occur on a bowl from Manchester with ovolo 1b (no 48). A non-conjoining sherd with this ovolo came from the same context at Inveresk and could be part of the same bowl. (NMS, exc. no 71 (12)).

The report by Brenda Dickinson on samian ware from excavations in 1976–7 (Dickinson 1988) adds further decorated pieces to the record. The more important pieces are included below as nos 14–16:

14. Form 29 variant. A badly made bowl with central cordon bordered by crude beads or uneven wavy lines, and at least two internal grooves behind the rim, which is apparently not rouletted. The upper zone has a length of scroll adjacent to a series of columns. The astragalus scroll-tie is on bowls from Wilderspool and Montans, the latter stamped by Malcio i (RGZM 2003189) and on an unstamped mould from Montans (Simpson 1976, fig 10, 43). (Dickinson 1988, 2.47).

15. Bowl with external groove above the ovolo and internal groove below the rim. The ovolo is type 2. Freestyle decoration with woman at altar (as on no 23), saltire with double-cogged diagonal ending in a ring, erotic group O.A and motif topped with an acanthus. The ovolo, erotic group and acanthus occur on a bowl from London with mould-stamp of Felicio iv (RGZM 2003196). The woman at altar and saltire with double-cogged diagonal and ring are on a bowl from Wilderspool (no 58) with identical decoration to that on a waster from Montans in Toulouse Museum stamped by Felicio. (Dickinson 1988, 2.58).

16. Lower part of bowl with footring as on form 29 and fine grooving over the whole of the interior. There is no internal stamp in the base; just a crude, freehand circle. Decoration shows running animals, probably a hare and boar, over a basal wreath of large chevrons. Although chevron wreaths are common at Montans no precise parallels have been found for this example. (Dickinson 1988, 2.56).

Nos 17–27 are from a single deposit recently excavated to the north of the fort (Wild forthcoming):

17. Very thick bowl in a lightish fabric with brown slip. Panels show an animal type, satyr O.609 and Bacchus with panther O.565 separated by a vine with grapes. The style is close to that of La Graufesenque, where the basal wreath of trifid buds was common in the Flavian-Trajanic period. It continued to be used at Montans by Florus iv (Mees 1995, Taf 246, 1, 4). Simpson (1976, 269) dates his work at Montans to *c* AD 100–130. The presence of this piece in a purely Antonine group suggests that work of this type may have been produced still later than this, unless it arrived on site as a treasured personal possession.

18. Small bowl, with shallow external grooves above the ovolo and two internal grooves below the rim. Attilus' ovolo, 3a, over an untidy scroll with tendrils ending in a bud (Hermet 1934, pl 14, 57). A similar scroll, but with different motifs, occurs on a waster from Montans with stamp of Attilus (Toulouse Museum). A similar bowl with different motifs, also from Montans, is stamped LCRE (Simpson 1976, fig 4, 13). Another (Simpson 1976, fig 5, 15) with stamp possibly reading L S CRE and possibly the same ovolo, shows a tendril ending in a degenerate arrowhead, as here. A bowl from Agen with a suggested date of *c* AD 120–160 shows the ovolo with an equally untidy scroll (Jacques and Martin 1997, fig 15, 80).

19. Rim sherd with internal grooves and external grooves above and over the ovolo, probably the result of careless finishing of the rim. Ovolo 4, used by Chresimus; figure type uncertain.

20. A poorly produced and moulded bowl with interior grooves and a slight chamfer below the decoration. The ovolo, blurred and faint, is probably ovolo 4, as on no 19. Panels with spiral, bird and hound O.1967, pair of gladiators (versions of O.1043, O.1044?) and Victory O.814. The Victory was used on a bowl with Chresimus' stamp from Caerleon (Hartley 2000, 189, fig 41, 126) which shows similar chevrons in the field.

21. Ovolo 1b. Panels with triangular bud junction masks contain the warrior O.164A without spear, small figure (cupid?) over bird to right O.2231 and warrior O.992. A bowl from York with internal stamp of Chresimus (RGZM 2003195) shows the ovolo, birds, borders and O.992. The small figure, also on no 6 above, is on a bowl from London with stamp of Felicio iv (BM unnumbered).

22. Small bowl with base as on form 29. Vertical border ending in a heart-shaped leaf and triple medallion containing the satyr with grapes O.597, with wavy line to either side. A similar triple medallion was used by Attilus at Montans (Simpson 1976, fig 14, 4), the satyr on the bowl from Strageath (no 41). A bowl from Saintes (Tilhard 1977, pl 6, 45) shows similar or identical decoration.

23. Ovolo 3b. Panels show, in shallow relief, a composite motif composed of a bottle bud and trefoil alternating with woman at altar (as on no 15), an uncertain group and in the right-hand panel, probably one of a pair of gladiators. Basal wreath of small chevrons. The bowl is from the same mould as no 32 from Newstead, with stamp of Chresimus.

24. Light grooving externally and two interior grooves below the rim. Shallow relief, lacking in detail, with ovolo 5, as on a bowl from Kenchester (RGZM 2003200), which has similar borders and rosettes in the panel corners. Panels contain the gladiator O.1008 and a bottle bud motif. The gladiator is on a sherd from Richborough from a mould stamped by Florus iv (Mees 1995, Taf. 246, 4; Simpson 1976, fig 2, 6), as well as on no 12 above, with Chresimus connections. The bottle bud, borders

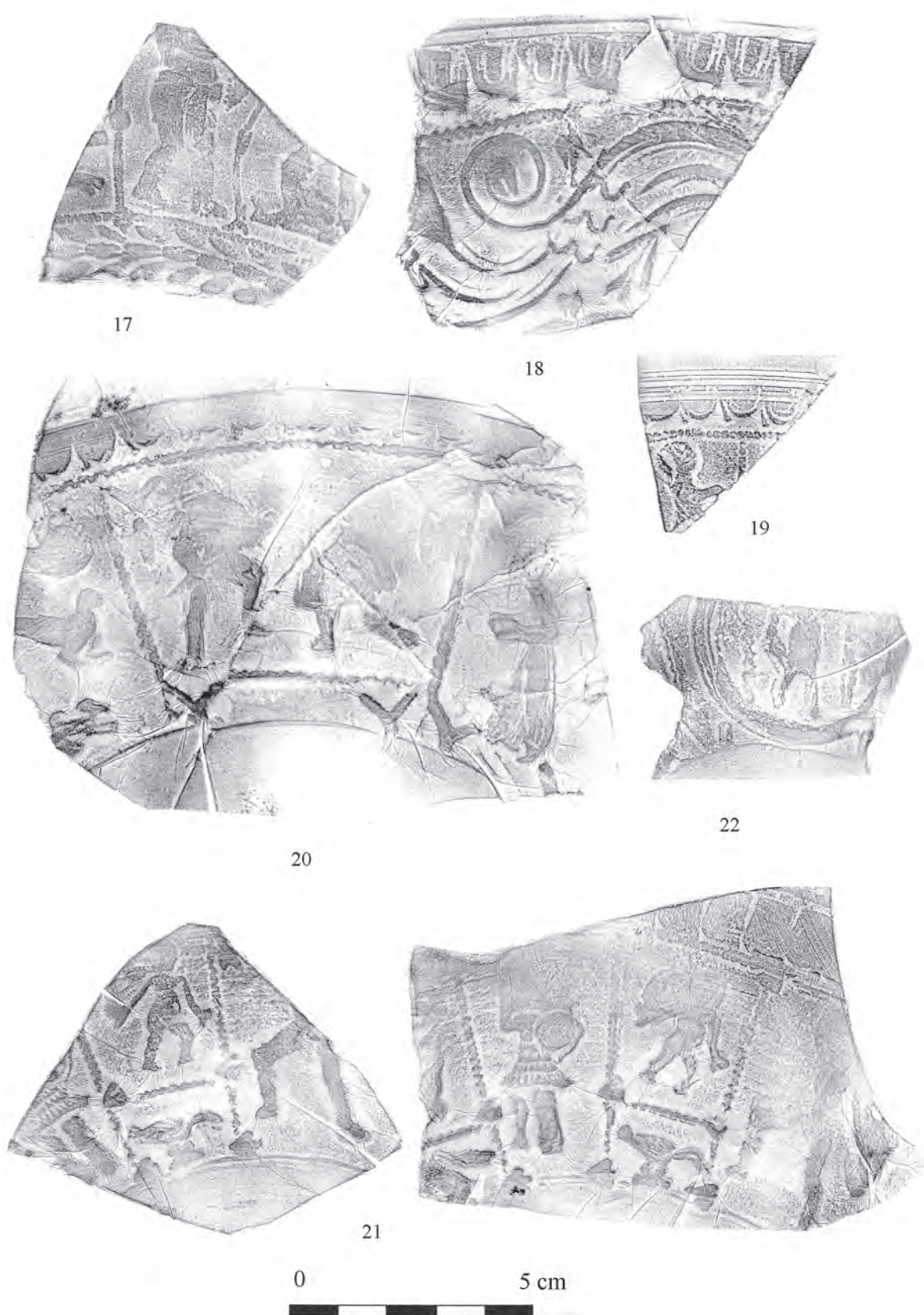


Fig 6. Montans ware from Scotland: Inveresk 17–22

and rosettes are on a bowl with ovolo 1a from Caerleon, stamped by Chresimus (Hartley 2000, 189, fig 41, 126).

25. Poorly moulded scroll bowl with fine grooving on the interior, two internal grooves below the rim, external grooving above the ovolo and a slight chamfer below the decoration. Ovolo 3c. Although obscured by shallow relief and lack of detail, the scroll may show the same astragalus binding as on no 14. A bowl from Saintes shows the bud (Tilhard 1977, pl 6, 43).

26. The fabric, with glossy slip, is more similar to that of La Graufesenque, but the types are reduced in size and lacking in detail. The ovolo, with tongue to right, is too indistinct for identification. Decoration shows satyr with hare O.602 as on the Kenchester bowl (RGZM 2003200) and no 38 from Old Kilpatrick, a vertical row of toothed chevrons and an untidy chevron basal wreath.

27. Complete base, standard for form 37 and unstamped, in light-coloured fabric not inconsistent with Montans, with a matt orange-brown slip. The lower part of the decoration shows panels with hound O.1927 and hare O.2072, not significantly reduced, alternating with figure types, of which only the legs and feet remain, one holding a shield(?), and a bud motif (Hermet 1934, pl 14, 84) both singly and arranged as part of a cross with a small triple bud similar to that used on no 31 as a junction mask. The larger bud, common at La Graufesenque, occurs on a Montans bowl from Wilderspool (Dickinson and Hartley 1992, fig 15, 41), but no parallels are forthcoming for the cross arrangement. The piece may indeed be from Montans though differing from the others in general appearance. No close parallels have yet been found to it or for the figure types. Its origin must remain uncertain, but its occurrence in a purely Antonine context at Inveresk must suggest a Hadrianic or Antonine date.

Lyne

28. Ovolo 1b and panels with triangular bud junction masks containing the warrior O.992, warrior with shield but not spear O.164A and a group of two women with a child riding a small animal. No 21 above shows the ovolo, borders and two warriors. A bowl from Wroxeter stamped by Felicio iv with the grass tuft and junction motif shows the women (Bushe-Fox 1914, pl 13, 11; the photograph shows the clearest detail of this little known and usually blurred group, and Bushe-Fox's interpretation of it, given above, appears convincing). A bowl from Vannes, also stamped by Felicio, shows the split-tongued ovolo, women and junction motifs (Martin and Triste 1997, 131, fig 8, 22). (NMS FX 271).

Mumrills

29. Four sherds of a shallow bowl with light grooving internally. A version of the Attilus ovolo, 3a.2, with impressions overlapping. Decoration, in horizontal zones with wavy-line borders, consists of a row of grass tufts impressed vertically, similar to the basal wreath on no 4,

from Balmuldy, above a wreath of chevrons (?) of which the upper tip appears to be branched. This is likely to have been the basal wreath. (NMS FRB 52; Macdonald and Curle 1928–9, 514, fig 80, 51).

Newstead

30. Ovolo 1a and panels with bud junction masks containing a standing warrior (a version of O.170). The ovolo, junctions and type are all on the bowl stamped by Felicio iv from Vannes (Martin and Triste 1997, 131, fig 8, 22). (NMS Elliot Collection).

31. Ovolo 1a and panel with hound to left, which also appears on the Felicio bowl from Vannes. Possibly from the same bowl as no 30. The detail is clear enough to show the junction mask is a trifold leaf. (NMS FRA 4067).

32. Three non-joining sherds from the base of a bowl with chamfer below the decoration and a 29-style base with the end of an internal stamp of Chresimus (die 4g). The decoration is identical to that on no 23 from Inveresk and the bowl is doubtless from the same mould. The edge of ovolo 3b is just visible above panels with the same composite motif, alternating with the woman at altar, a blurred and uncertain group and a pair of gladiators over trifold bud. A third bowl from this mould, with a better impression of the gladiator panel comes from recent excavations at Drapers' Gardens, London (Mills forthcoming). A sherd from Manchester (no 50) shows the same ovolo and gladiators, and may also be from the same mould. The Newstead bowl, however, is the only one to preserve a stamp. (NMS FRA 2057).

Old Kilpatrick

33. Hartley (1972, 44) considered that Miller nos 8, 29 and 51 belonged to the same bowl. The ovolo, here listed as 6a, is similar to, but smaller than ovolo 2, used by Felicio iv. The figure on the left (a version of the maenad O.369) is on a bowl with ovolo 2 from York (1990.21), the four-leaved plant on a bowl in Felicio style from Montans. (GLAHM F.1928.288/8, 289/2?; Miller 1928, nos 8, 29, 51).

34. Lower part of the decoration with basal wreath of chevrons below a plant motif and lion (as O.1394?) over grass tuft. There is a slight chamfer below the decoration. The decoration is identical to that on a bowl from Carlisle (Tullie House Museum, unnumbered) stamped by Felicio iv. (GLAHM F.1928.288/2; Miller 1928, no 3).

35. Lower part of decoration, also with a slight chamfer, with chevron wreath beneath a cogged bar ending in a ring, as on a waster from Montans stamped by Felicio iv, and the lower part of an arcade ending in a fishtail, *cf* no 2 from Ardoch. (GLAHM F.1928.288/1; Miller 1928, no 6).

36. Bottom of the decoration, with chamfer removing the lower edge of the chevron basal wreath. Spiral and wreath as on the Felicio iv bowl from Camelon (no 7 above) (GLAHM F.1928.288/5; Miller 1928, no 5).

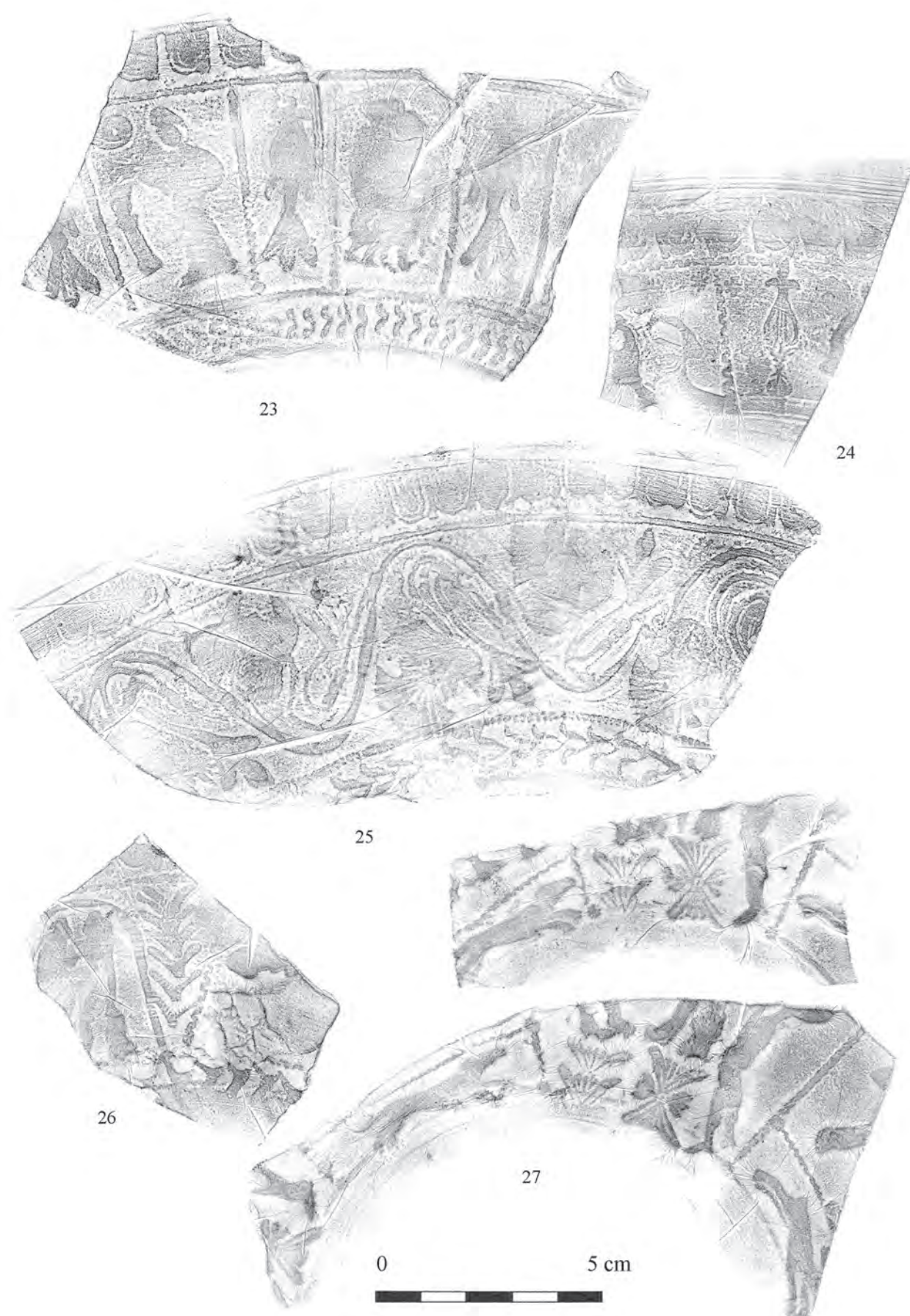


Fig 7. Montans ware from Scotland: Inveresk 23–27

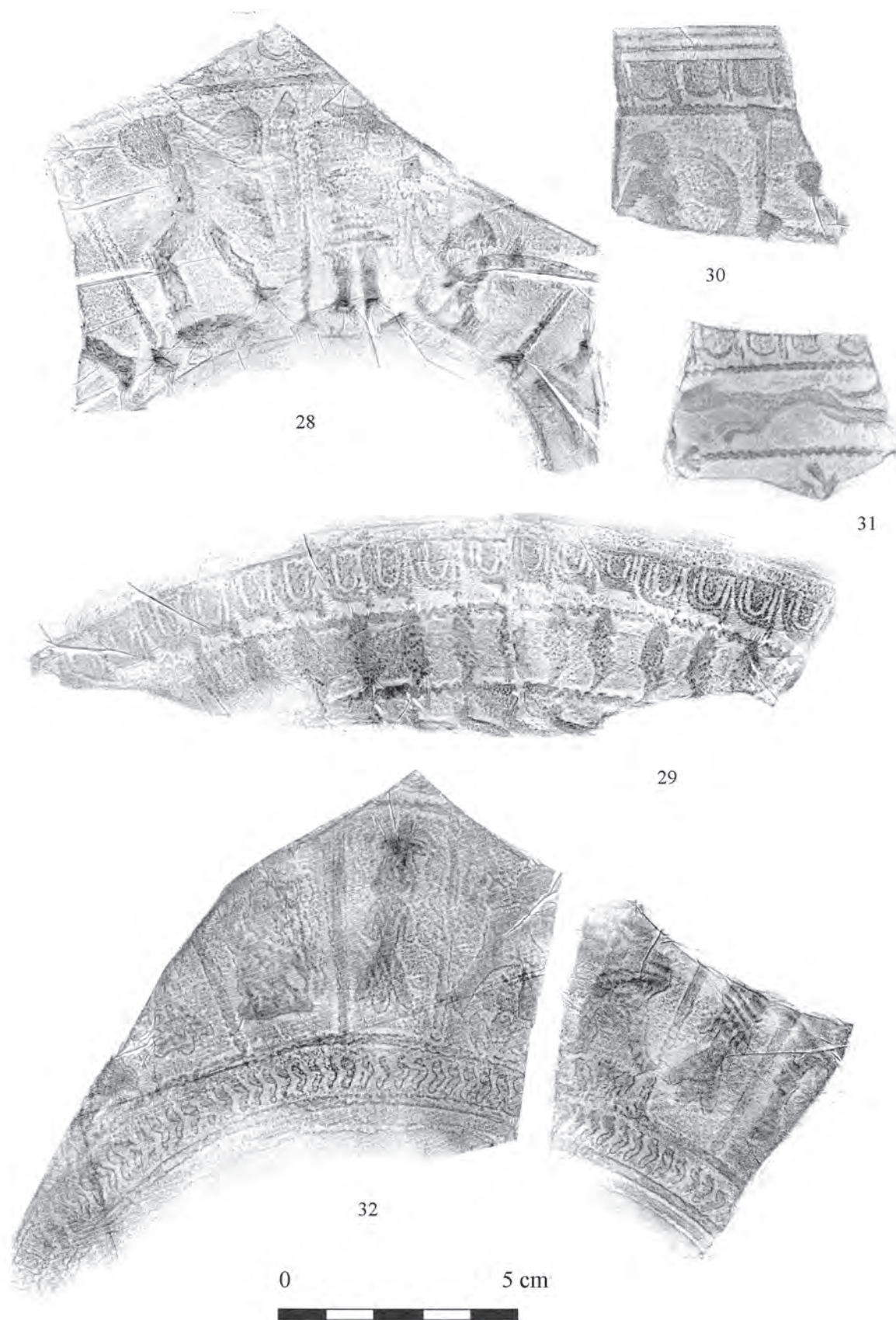


Fig 8. Montans ware from Scotland: Lyne 28, Mumrills 29, Newstead 30–32

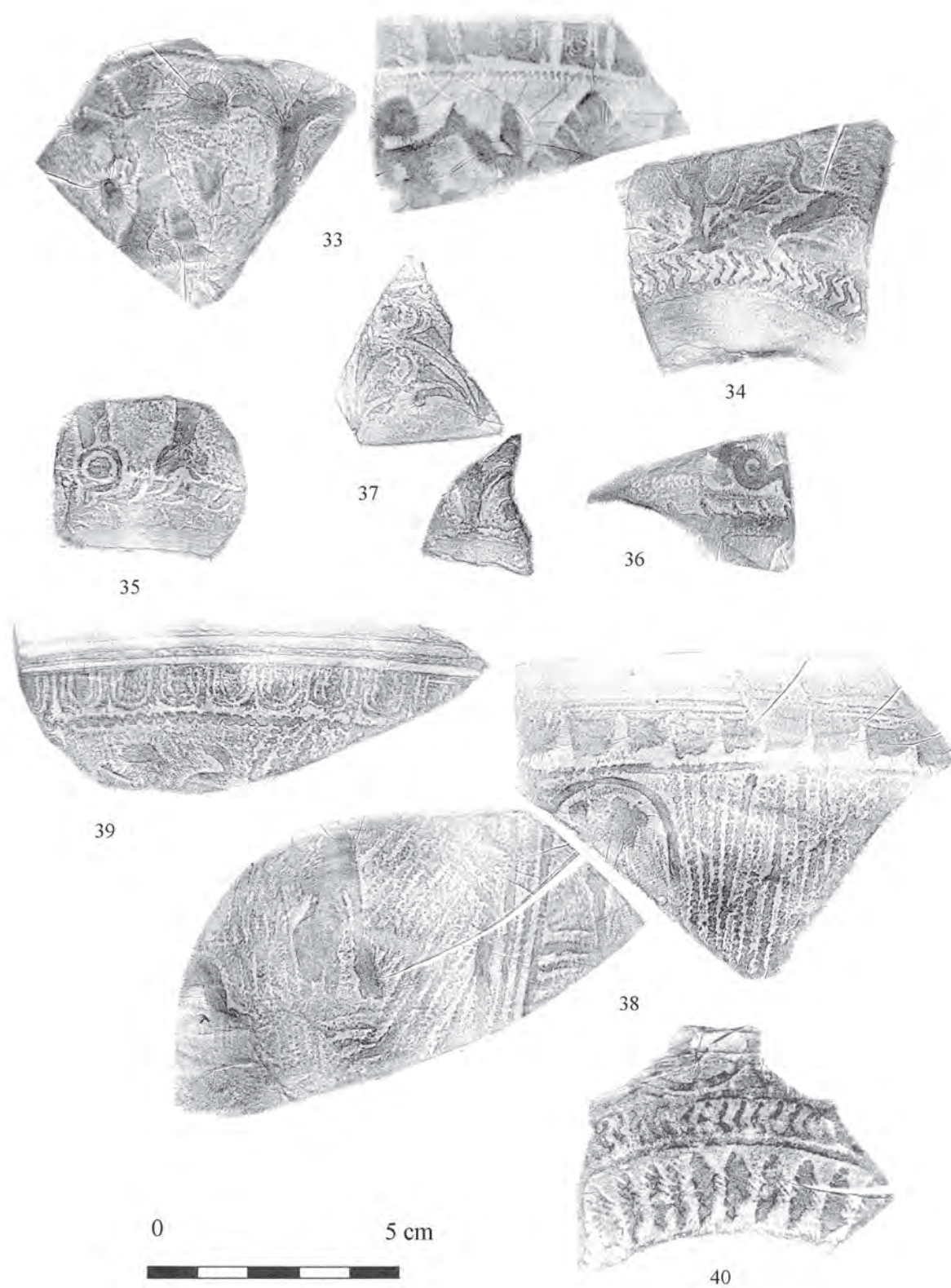


Fig 9. Montans ware from Scotland: Old Kilpatrick 33–39, Rough Castle 40

37. Two scraps with (if from the same bowl) a zone of leaves above a wreath of triple buds and rosettes, as on the bowl from Wilderspool (no 60). The wreath of buds and rosettes occurs with a zone of different leaves on bowls from York (unnumbered) and Wroxeter (Bushe-Fox 1916, pl 26, 2), both stamped by Chresimus. (GLAHM F.1928.287; Miller 1928, 56, 61).

38. Two sherds of bowl with internal grooves and external groove above the ovolo. Ovolo 5. The decoration consists of panels largely filled with bead rows, with the satyr with hare O.602, which occurs with this ovolo on a bowl from Kenchester (RGZM 2003200). The figure in the arcade on the second sherd appears to be the same satyr, which occurs under an identical arcade on no 26 from Inveresk. The two sherds have at some time been stuck together, but the edges are abraded and the join, if it was a join, is weak. The lower part does not look like the same type. (GLAHM F.1928.289/2; Miller 1928, no 9).

39. Bowl with internal and external grooves above the ovolo. Ovolo 3c, which the clearest impressions show with a trident tongue. Panel with Diana, which Hartley thought probably the same as that on a Wroxeter bowl stamped by Felicio iv (Hartley 1972, 45). (GLAHM F.1928.289/1; Miller 1928, no 10).

Rough Castle

40. Basal wreath of vertical impressions of a grass tuft, beneath a wreath of neat chevrons. Too little survives to be certain of the main zone of decoration, but probably medallions or a scroll. The chevron wreath is closely similar to that on the Chresimus bowl from Newstead (no 32), though the chevrons point in the opposite direction. The wreath of grass tufts is similar, though slightly smaller than those on a scroll bowl from Wilderspool (no 61) and on a bowl from Agen with the mould stamp L S CRE (Jacques and Martin 1997, 57, fig 9, 61). (NMS FR 293).

Strageath

41. Ovolo 3b and panels with Victory O.814 and an uncertain group interpreted by Hartley as perhaps a variant of the drunken Bacchus O. 560 alternating with an arcade containing the satyr with grapes O.597. Similar arcade supports with fishtail ends, though slightly longer than these, occur on a bowl from Wilderspool (no 54). The group may possibly be the same as that on the Chresimus bowl from Newstead (no 32), though on the clearest impressions (no 23 and the London bowl) there appear to be two pairs of feet at the base, pointing right, so the identification remains uncertain. (Hartley 1989, 216, D34).

7.1.1 Sherds from Scotland originally regarded as of possible South Gaulish origin

Newstead: Espalion

No 42, from an Antonine I level at Newstead, was originally published by Birley (1949–50, 27, fig 6, 4),

who discussed its South Gaulish connections, tentatively attributing it to the Antonine period. Hartley (1972, 44) noted the presence of other similar sherds at Newstead (nos 43–4), commenting that they were unlikely to be part of the group from Montans. They are now known to have originated at Espalion and are presumably residual from the Flavian occupation of the site.

42. Two sherds from a bowl with an internal groove, as on form 30, and a distinctive, squarish, ovolo, with narrow core and straight tongue to right, bordered by two horizontal rows of square beads enclosing a straight wreath of buds. The ovolo is Tilhard's ovolo j, used by Group AE at Espalion (Tilhard 2009, 228, fig 7, 7), as were the beaded circle (AE/7) and the S-shaped gadroons (AE/25) which form the basal wreath. The gladiator O.1020 and hound to left O.2008 are both La Graufesenque types, reduced in size. A bowl with the same ovolo, straight wreath and beaded circle comes from Ribchester (Simpson 1985, fig 3, 16; RGZM 2001316). There is little firm dating evidence for the work of this group, for which Tilhard suggests a date *c* AD 65/70–85, suggesting that the sherds are in fact residual from the Flavian occupation at Newstead. (NMS FRA 1657; Birley 1949–50, fig 6, 4).

43. Small sherd showing the same ovolo, square-beaded border and medallions with the beaded circle as on the Ribchester bowl. The sherd could not be located to check whether there was an internal groove. (NMS).

44. Another sherd, with small internal grooves and the same ovolo and horizontal wreath of gadroons as on no 42. There is a sherd with identical decoration from London (Museum of London 5948G; RGZM 2007609). (NMS 4141).

Castledykes: Les Martres-de-Veyre

45. Basal wreath of chevrons enclosed between two straight lines. The sherd was tentatively included by Hartley as possibly from Montans. However, the orange fabric and smooth orange slip are quite unlike any of the pieces from Montans and suggest the origin as Les Martres-de-Veyre. A bowl from Les Martres-de-Veyre in the style of Cettus, a potter whose work is common in Antonine Scotland, now provides a close parallel to the wreath (Terrisse 1968, pl 220, 507). (GLAHM F.1939.73; Robertson 1964, fig 35, 9).

7.2 North-West England

Manchester

Although the stamp from no 46 is listed in Hartley and Dickinson 2008–12, the bowls are all unpublished and the numbers given below are excavation numbers. Nos 47–52 are from excavations in Deansgate, outside the fort to the north-east.

46. Base, with stamp of Felicio iv (die 1d) and a panel containing a triple medallion with the hare O.2105. In the lower panel corners are concentric circles, similar to

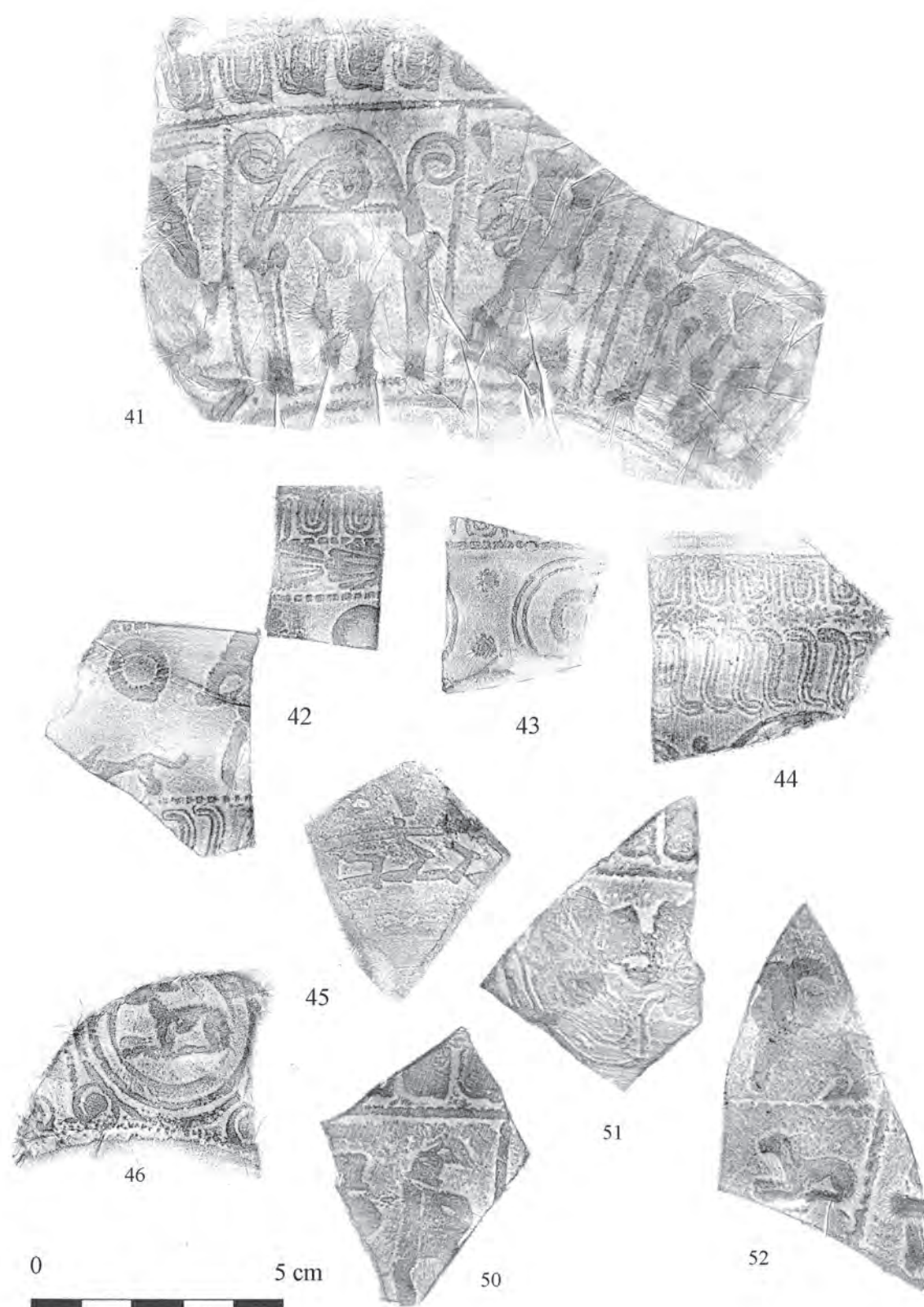


Fig 10. Montans ware from Strageath 41, Espalion ware from Newstead 42–44, Les Martres-de-Veyre ware from Castledykes 45, Montans ware from Manchester, 46, 50–52

those that occur at the ends of the cogged saltire on the bowls from Inveresk (no 15) and Wilderspool (no 58). The medallion with hare occurs with ovolo 2 on no 9 from Camelon. (78.265).

47. Seventeen sherds from a crudely made bowl with internal grooves below the rim, heavily worn base of the style associated with form 29 and grooves for repairs with lead clamps, of which traces remain. There is an internal stamp of Chresimus (die 4a). Decoration, with the split-tongued ovolo (1a) stamped upside down, shows panels with the warrior O.992 and an arcade containing male figure O.635 alternating with smaller panels with the boxer O.1175 with broken left leg over hare to right, hare to left or a panel of crude leaf tips. There is a row of striated spindles placed vertically at the base of some panels. The boxer, with unbroken leg, is on a bowl from Lectoure stamped internally by Malcio i (RGZM 2003193; Simpson 1976, fig 4, 11). O.992 and the hare to left are on a bowl stamped by Chresimus from York (RGZM 2003195). (DGM04 (195) (60); RGZM 2003194).

48. Five sherds from a fairly thin bowl with internal groove below the rim and the same ovolo (1a) as above, but the right way up. Panels with wavy line borders and triangular bud junction masks show Minerva carrying a helmet O.136 and Diana O.104B with Victory O.814. The Diana, Victory and triangular masks appear together on a bowl from Wilderspool (Dickinson and Hartley 1992, fig 16.49) and on a bowl from Wroxeter stamped by Felicio iv. (DGM04 (195)).

49. Four sherds from the lower edge of a thicker bowl than no 48, with basal wreath of trifid buds and a slight chamfer beneath the decoration. Panels with the triangular bud junction show the same Diana O.104B and Victory O.814, an urn and the feet of the warrior O.992. The difference in thickness suggests that this is not the same bowl as no 48 and the basal wreath appears to be different. (DGM04 (58) (60) (176) (198)).

50. Ovolo 3b and panel with the same pair of gladiators as appear on the Chresimus bowl from Newstead (no 32) and that from Drapers' Gardens, London. The decoration is identical and this could be another bowl from the same mould. (DGM04 (195)).

51. Ovolo 1b and scroll with leaves are represented, possibly as on a bowl from Agen in the style of Felicio iv (Jacques and Martin 1997, 66, fig 14, 72). (DGM04 (58)).

52. Too little of the ovolo survives for identification, but panels show a goat over the hare O.2105. The hare appears on a bowl with stamp of Malcio i from Lectoure (RGZM 2003193; Simpson 1976, fig 4, 11) and on no 46, with stamp of Felicio iv. The goat is probably that on the mould of a form 29 variant from Montans in Albi Museum (Simpson 1976, fig 6, 26). (DGM04 (201)).

Wilderspool

The pieces selected for publication and comment below include sherds from the 1966 excavations (Dickinson and

Hartley 1992) and nine of the eleven pieces published by Simpson (1987). Her nos 9 and 10 have been omitted. No 9, with a well-known but anonymous ovolo with trident tip turned to the left is certainly from La Graufesenque (for a close parallel, see RGZM 2000742); no 10 may also be. The pieces illustrated here all show links to the Scottish material and the Attilus-Chresimus-Felicio iv group apart from no 63, which is either by a different group of potters, was produced at an earlier period or, indeed, both.

53. Small bowl with internal and external grooves, the latter above the ovolo. Ovolo 3a.2, with the loops between the tongue and core visible on the clearest impressions. Decoration takes the form of arcades containing a lion, almost certainly that which occurs on a bowl from Montans stamped by Attilus (Simpson 1976, fig 4, 14), and a version of the griffin O.882, with a spray of three poppy heads between the arcades. (WAGMG 1958.12.315).

54. Three conjoining sherds of a bowl with external grooves above the ovolo. Ovolo 1, probably 1a. Fishtail-based uprights supporting a pediment containing a bird over the Victory O.814 with frond to either side, a tree composed of the same fishtail upright topped by a seven-leaved branch and a spiral to each side, a vertical row of chevrons bordered by double wavy lines and a version of the Mercury O.528, all over a basal wreath of the same chevrons. The Victory and frond were both used by Felicio iv. Parallels to the frond are cited under no 11 above, from Cramond. The seven-leaved branch is on a bowl from Montans with stamp of Attilus in the decoration (Simpson 1976, fig 4, 14). (WAGMG 1958.12.339; Simpson 1987, 1).

55. Two conjoining sherds from a bowl with external grooves above the ovolo and a slight chamfer below the decoration. Ovolo 1a. A similar chevron panel and basal wreath to no 54 and a tree with the same seven-leaved branch at the top and pairs of spirals down the sides. (WAGMG 1958.12.306; Simpson 1987, 2).

56. Three conjoining sherds from the same small bowl with internal and external grooves below the rim and a 29-style base but no internal stamp. From the smallest sherd, the ovolo is clearly ovolo 4, though elsewhere it is smudged and appears more similar to ovolo 5, suggesting that the two ovolos may, in fact, be the same. Decoration shows a hare O.2072 and hound O.1927 over bud motifs, alternating with an arcade containing a rosette over the cupid O.435, as on the bowl from Camelon (no 8). The hare appears on a bowl stamped by Felicio iv from Wroxeter (Bushe-Fox 1914, pl 13, 11). Hartley's archive contains the rubbing of another sherd presumably from the same bowl (WAGMG 1956.11) which is included here, though unfortunately the sherd could not be located for re-rubbing. (WAGMG 1958.12.275, 304; Simpson 1987, 4–5).

57. Panel decoration with multiple borders, with

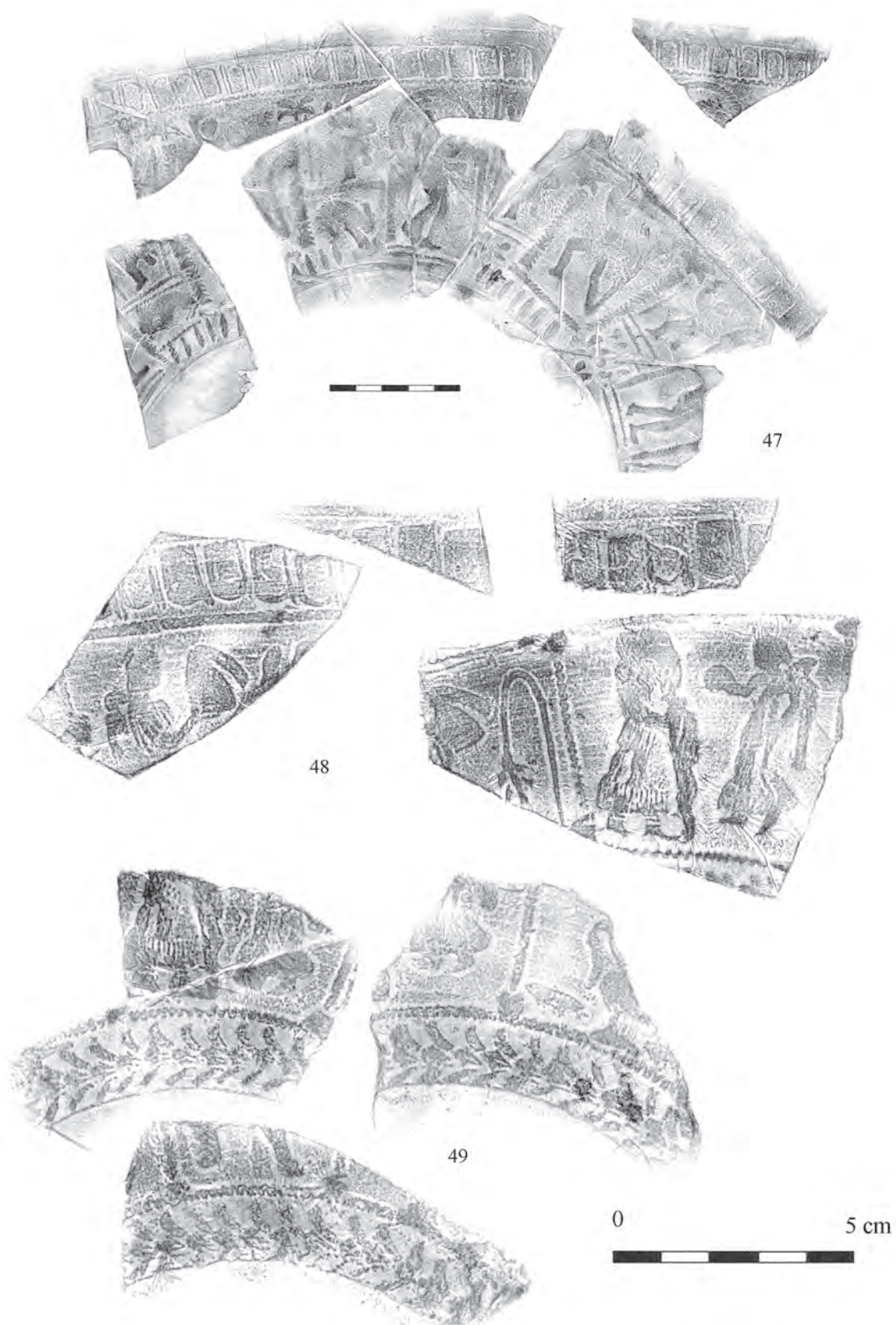


Fig 11. Montans ware from Manchester 47–49



Fig 12. Montans ware from Wilderspool 53–55

the draped man O.883, an arcade with fishtail uprights containing the warrior O.164A above a cushion motif and possibly the satyr with hare O.602. (WAGMG 283 13; Simpson 1987, 6).

58. Saltire with crossed coggled diagonals ending in a ring, as on no 15, with a five-leaved plant motif between them and chevron basal wreath. Identical decoration occurs on a waster from Montans in Toulouse Museum stamped by Felicio iv. As on the Montans bowl, the figure on the left is the woman at altar (as on nos 15 and 23). (WAGMG 1958.12.411; Simpson 1987, 7).

59. Sherds from at least two different bowls show ovolo 1a and panels with the triangular bud junction containing Diana and hind O.104 and the warrior with shield (a version of O. 170) as on no 30. The types occur together on a bowl with the same ovolo and junction motif from Drapers' Gardens, London (Mills forthcoming) and on the bowl stamped by Felicio iv from Vannes (Martin and Triste 1997, 1331, fig 8, 22) Two sherds are illustrated here, though it has not been possible to check that they are from the same bowl. (WAGMG 1958.12.164; Simpson 1987, 11 and WIL 66 F 4 +).

60. Probably ovolo 4 as on no 56. Small bowl with row of leaves above a basal zone of vertical plant motifs divided by rosettes, identical to that on no 37 and on a bowl stamped by Chresimus from York. The lower tips of the plants and rosettes appear as an ovolo replacement on no 8, from Camelon. The bowl may be from the same mould as one from Wroxeter (Bushe-Fox 1916, pl 26, 2). (WIL 66 F6.7; Dickinson and Hartley 1992, fig 16, 51).

61. Scroll with a leaf in the lower concavity and a tendril(?) in the upper, over a basal wreath of vertical grass tufts. The basal wreath occurs on a bowl from Agen with mould stamp L S CRE (Jacques and Martin 1997, 57, fig 9, 61). For similar, though slightly smaller versions of the wreath *cf* nos 4 and 40. (WAGMG 1958.12.78).

62. Sherd in a paler fabric than the other pieces, with crude panel decoration showing a hare or hound and two stumpy figures, one probably a further reduced version of the man O.635 which occurs on nos 12 and 47. Simpson thought that the rectangles were stamps, possibly of Felicio, though Hartley felt that this was illusory. There are no examples of Felicio iv's mould stamps from north Britain and no features to associate the piece with Felicio's style. It is clearly a debased copy. (WAGMG 201.10; Simpson 1987, 3).

The 1966 excavations also produced two panel bowls belonging to the Chresimus-Felicio iv group (Dickinson and Hartley 1992, fig 16, 49, 53). Both show panels with triangular bud junction masks and grass tufts. One shows Diana and hind O.104B, satyr with grapes O.597 and Victory O.814, the other the warrior O.992, all types which occur commonly on the Scottish bowls.

63. Row of circular medallions containing a small mask above a basal wreath of bifid motifs. Identical decoration occurs on a bowl from Wroxeter with a large

tongueless ovolo. The basal wreath is on a bowl from Agen (Jacques and Martin 1997, 53, fig 10, 62) with links to Attilus' style and on two bowls from Saintes (Tilhard 1977, pl 6, 49–50). All three bowls are in a different style to the present piece, the bowl from Agen dated *c* AD 80–100. Simpson suggests *c* AD 100–140 for the present piece, a suggestion reinforced by the absence of pieces in this style from Scotland. (WAGMG 1958.12.30; Simpson 1987, 8).

8. Concluding Remarks

The present paper has attempted to define the decorative style of a single group of Montans potters whose work arrived in Scotland during its period of occupation *c* AD 140–60. It is hoped that it will not just aid future specialists in the recognition of Montans ware but will also help to provide a framework for the closer dating of this ware in general. This is not the complete picture: far from it. Only with the study of the Montans decorated ware from Britain as a whole, from the other northern sites (*cf* Ward this volume), from the south and, particularly, from London, will it be possible to assess the full range of styles imported from Montans and the extent of its distribution. These matters must remain for future research.

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Particular thanks must be recorded to the museum staff who devoted so much time to what can only be described as searching for needles in haystacks: Dr Fraser Hunter and Jim Wilson of the National Museum of Scotland, Dr Sally-Anne Coupar and Jayne Stewart of the Hunterian Museum, University of Glasgow and Michelle Hill, Head of Collections at Warrington Art Gallery and Museum. Their task was particularly arduous where material was

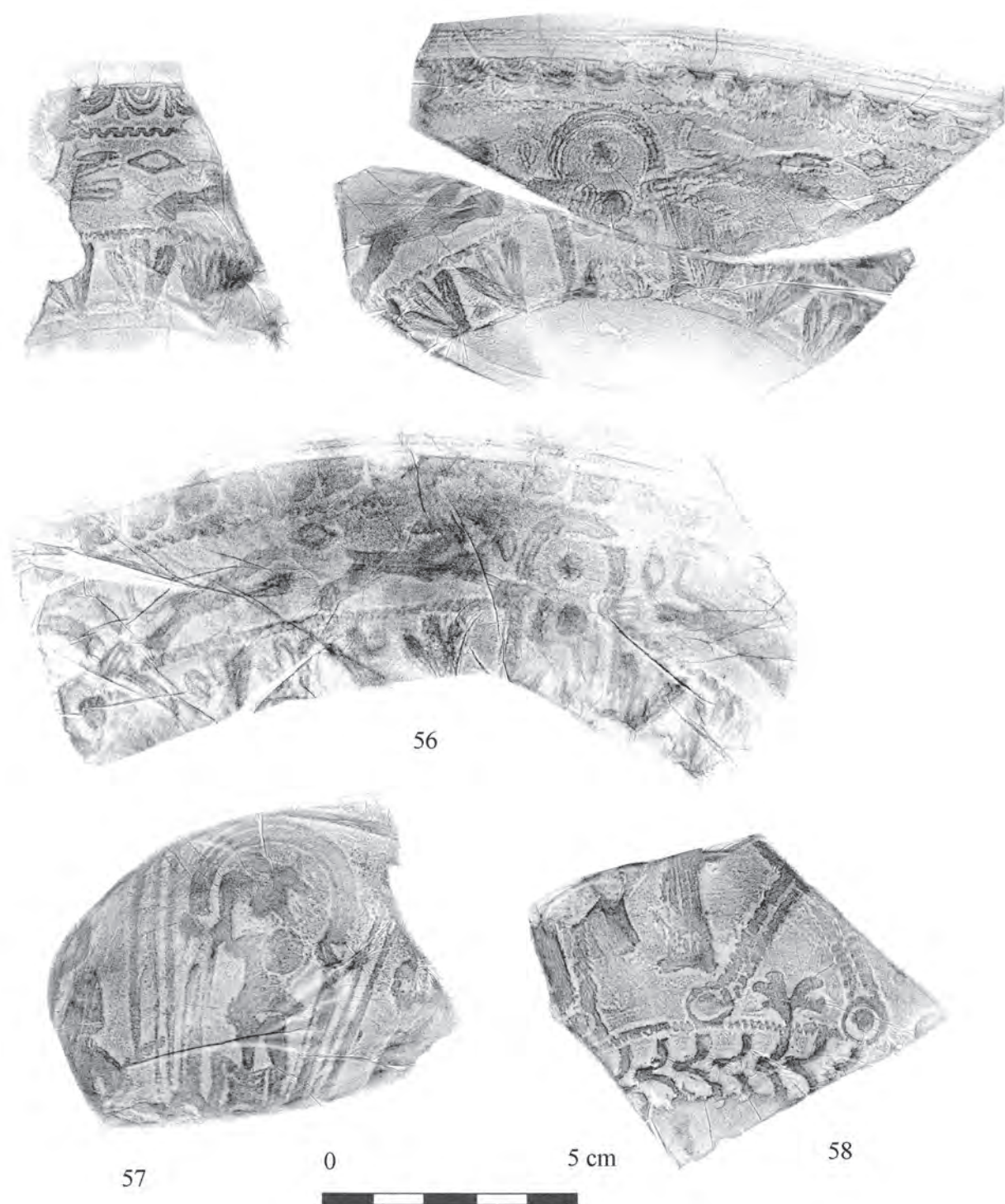


Fig 13. Montans ware from Wilderspool 56–58

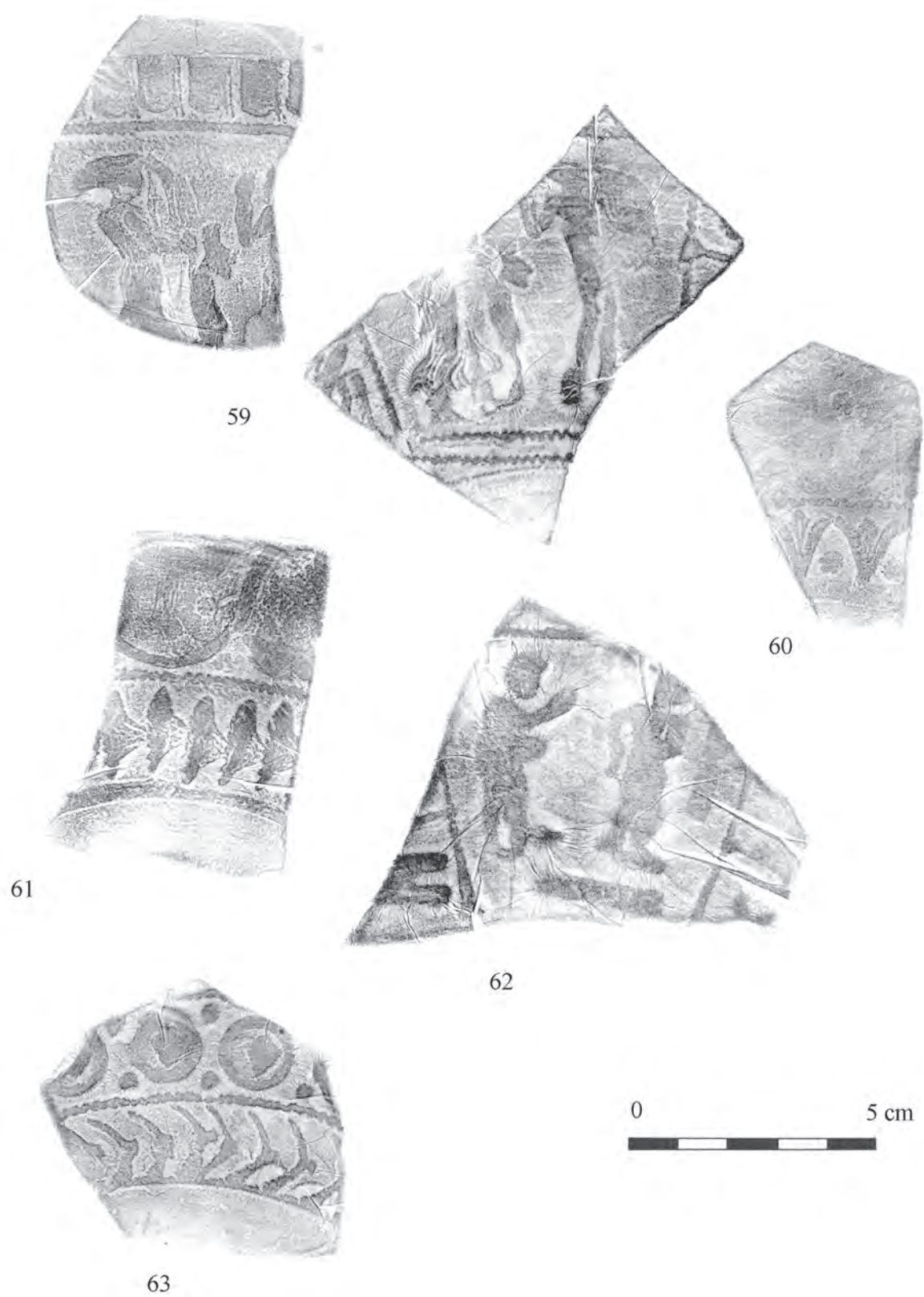


Fig 14. Montans ware from Wilderspool 59–63

unrecorded at the time of Brian Hartley's visit or accession numbers unknown. Any remaining gaps in the record are certainly not due to lack of trying. Finally, my thanks to John Peter Wild and Brenda Dickinson for reading the manuscript and their suggestions for improvement.

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Reviews

La production de sigillée et de céramique fine gallo-romaine de Gueugnon (Saône-et-Loire), J.-C. Notet, 2012, Revue Archéologique de l'Est, 32nd supplément, Dijon; 256 pages, 201 figures. ISBN 978-2-915544-22-0

Reviewed by Robin P. Symonds

Gueugnon is a town in the western part of the modern French department of Saône-et-Loire, in south-central Burgundy. In the Gallo-Roman period it is thought to have been a small town but it is principally known for its pottery production centre, at the site known as Vieux-Fresne, where so far more than sixty kilns have been recorded in various excavations from the 1960s to the 2000s. Although the production began in the first century, including Gaulish-type flat-bottomed amphorae that are known to have travelled as far as Britain (Laubenheimer with Notet 1986; Laubenheimer 2003), this volume is specifically concerned with the sigillata and fine wares from the site which belong almost entirely to the second and third centuries AD. This will undoubtedly come as a disappointment to some readers: Gueugnon has long been thought to be one of the important production centres of Burgundy, but after this publication there remains a need to know more about the amphorae, the mortaria and the other coarse wares, all of which may have been exported both regionally and further afield. This publication, nevertheless, is a major contribution to our knowledge of this important site.

There are several curiosities about Gallo-Roman pottery production at Gueugnon, beginning with its geographical location. It is situated on the Arroux river, which flows generally south-west from Arnay-le-Duc, via

Autun, Toulon-sur-Arroux and Gueugnon before joining the Loire at Digoin; it also lies along a Roman road leading from the Loire at Digoin to Autun and Alésia. Compared to the various workshops considered to be part of central Gaul or those of the Argonne region, it is quite isolated, as are the production centres at Domécy-sur-Cure and Jaulges-Villiers-Vineux. In my book on fine wares I allocated these centres to a region that I called mid-Gaul (Symonds 1992, Chapter 4, 27–38), but in truth these centres are further from each other than Gueugnon is from the nearest central Gaulish production centre at Lubié-Lapalisse (60 km away), and so it is a little tenuous to suggest that they constitute a group (Gueugnon is 130 km to the north-east of Lezoux, 120 km to the south of Domécy-sur-Cure and 185 km to the south of Jaulges-Villiers-Vineux). In the last section of this volume there is a provisional distribution map for Gueugnon fine wares, and a reproduction of Pierre-Henri Mitard's map of the distribution of Drag. 45 mortaria from the site, but otherwise little work seems to have been done to show what markets the production at Gueugnon was intended to supply. The site itself, and a brief history of its exploration, form the first chapter of the book.

The potters at Gueugnon seem to have begun making sigillata from the beginning of the second century AD. The only exception represented here is a single Drag. 29 (fig 40), described as probably local (though not analysed) but whose characteristics are interpreted as indicating that it is a late version of the form, perhaps as late as the first quarter of the second century (page 60). Notet's second chapter describes the plain sigillata and fine ware types made at the site: these seem to have been the cup forms Drag. 33 and 46 (figs 8 to 10; the latter form is also illustrated as a service of 46 form dishes and cups); the cup or bowl forms Drag. 40, 37/40 and 38 (fig 11); and

the dish and cup forms Drag. 31, 32, 35/36 and Walters 79 (figs 12 and 13), plus some more rare forms (fig 14). These were accompanied by various beaker, cup, dish, bowl and mortarium forms that appear mostly in a black or dark metallic colour-coated fabric, but many of which were also made in a red sigillata-like fabric. Among these forms are the Déch. form 72, in both red and black (figs 15, 16 and 18), and the mortarium forms Bet *et al* 1989 form 096/Curle 21 (fig 31) and Drag. 45 (figs 32 to 35), also in red and black.

The black metallic fine wares include the full range of second to third century beakers, except that there are no beakers with white barbotine or white painted decoration. The typology begins with cornice-rimmed roughcast-decorated tulip-shaped beakers (fig 17 nos 1 to 3; as in Symonds 1990), accompanied by a cornice-rimmed beaker (fig 17 no 4) with underslip barbotine that is labelled type B barbotine in Symonds 1992 (24 and fig 11) – the rim and the body shape of this beaker are clearly different from the vessels with this type of decoration that were illustrated in my book. This is a little baffling, since locations of the latter examples do not immediately suggest that they were necessarily made at Lezoux or at some other specific central Gaulish production centre and a possible Gueugnon origin might serve as an explanation for the style of barbotine that is obviously different from the style (type A) commonly associated with Lezoux. The rim and body shape, however, do not lend support to that idea, along with the fact that Notet illustrates only one example with type B barbotine. Type A barbotine decoration (*cf* Symonds 1992, fig 10) is represented in the Gueugnon repertoire in fig 16 (nos 5 to 11). Yet there is also hairpin barbotine (fig 17 no 7), and more than one style of barbotine scale decoration (fig 17, nos 12 and 14), both being styles that appear among the pre-Flavian vessels from Lyon, Central Gaul, and the Lower Rhineland as well as on glazed wares illustrated in Greene 1979. Even if one accepts that these latter vessels could have been made as late as the last quarter of the first century (and they could all be somewhat earlier than that), they must be significantly earlier than the bulk of the sigillata reported on by Notet. There are, however, also beakers and other forms mainly from Lezoux with a style of excised decoration (figs 15, 16, 18, 23, 24, 27 and 29) very similar to that of a series of vessels illustrated in my 1992 book (pls 4–7 and figs 4–6), and these must be no earlier than the middle of the second century. Finally, there is a style of stamped decoration made of small wheel-like circles that seems to be unique to Gueugnon (figs 27, 28 and 31).

The most common beaker form is the globular necked beaker (figs 21 and 22), Niederbieber 33 or Symonds form 1 (1992, 47), which occurs in plain versions, and with either round or long oval indentations, all with or without two or three individual horizontal bands of rouletting at the shoulder, at mid-body, and or at the join of the base

with the body. This form belongs to the late second and third centuries, and its typology is remarkably similar to that of the most common beakers made at Trier (about 500 km to the north-east). The form is not unknown at various central Gaulish production centres including Lezoux, as can be seen in Symonds 1992, figs 9 and 12, but the Gueugnon examples are generally closer in style to Trier products than to the central Gaulish versions. Notet offers no quantification of his types, but to judge by the number of illustrations, the Niederbieber 33 is perhaps the most common Gueugnon beaker type, yet it is the only fine ware form that is closer to Trier products than to those of central Gaul.

Apart from the beakers there is a variety of other fine ware forms, such as cups, including Drag. 40s (fig 25), cups with pedestal bases (fig 29) and a goblet or chalice with excised decoration (fig 23, no 1 and fig 24; to be compared with the Déch. form 64, or Symonds nos 35 to 37 and 43, all with moulded decoration, or with Symonds no 214, with underslip type A barbotine). There are also dishes or plates (fig 26), in forms similar to Stanfield's form 26 (Stanfield 1929), as well as Drag. 36 and Walters 80 (but apparently no 79s), and the following figures (27 and 28) show more examples of Stanfield's form 26, mostly with Gueugnon's distinctive stamped/excised decoration with small groups of circles or circles connected by curvilinear excised lines. Figure 30 shows a variety of bowls with thickened walls, some plain, some with underslip barbotine, and some with Gueugnon-style stamped/excised decoration. The fine ware typology is completed with mortaria, occurring in two main types. First, Curle form 21 appears in two versions on figure 31: nos 1 to 3 correspond to Bet and Delor 2000, form 97, and nos 4 to 8 are Bet and Delor, form 96. Secondly, figures 32 to 35 show the range of Drag. 45 mortaria, including standard sigillata versions (fig 32) and black fine ware versions, including examples with stamped decoration, the latter mostly without the usual lion's head spout, although many fragmentary examples may have had spouts that are now missing.

At the end of Chapter 2 there are two pages of figures that recapitulate all the plain sigillata (fig 37) and (black colour-coated) fine ware forms (fig 38). What is fascinating about these two figures is the way that they demonstrate simultaneously the lengthy evolution in red and black fine ware development at Gueugnon, the interconnections between the sigillata and black fine ware forms, and the interconnections of most of these forms with other production centres in central Gaul, in north-central Gaul, and in the Rhineland. There does not seem to be too much doubt about the production of all these types at Gueugnon: the analyses presented in Chapter 6 are perhaps not conclusive for all the fabrics, but the second and third century sigillata and fine wares do seem to be locally-made, and while there is a lack of first century sigillata, the fine wares that probably belong

to the Flavian period could easily have been made at the same time as the flat-bottomed amphorae that are known to be early (Laubenheimer and Notet 1986; Laubenheimer 2003). The distribution of Gueugnon products is touched on only briefly at the end of the book. Yet, given the wide variety in the fine wares presented here, one has to wonder how many Gueugnon products there are among the apparently central Gaulish vessels that I recorded in the 1980s, at places such as the Musée des Antiquités Nationales, the Musée Carnavalet, the Musée de Moulins, the Musée d'Alésia, the Musée Archéologique de Dijon, the Musée Bargoin at Clermont-Ferrand and the Musée Déchelette at Roanne. At present, such a question remains rather more difficult to answer than I expected it would be thirty years ago.

The main part of this book, Chapters 3, 4 and 5, is devoted to the sigillata from Gueugnon. Chapter 3, whose 122 pages take up almost half the volume, is concerned with the mould-decorated vessels, while Chapter 4 discusses the applied-moulded and other relief decorations, and Chapter five deals with the potters' stamps and signatures. Apart from the single Drag. 29, perhaps locally-made, illustrated at the beginning of Chapter 3, otherwise the mould-decorated sigillata is almost entirely composed of later Drag. 37 bowls. There are a few sherds that are likely to be Lezoux products, including a signature of Secundinus, three stamps of Cinnamus and the upper part of a Déch. 64 probably by Libertus, all having been found outside the workshop deposits. However, the main catalogue illustrates and describes the work of fourteen main potters, all named except the 'potter of the rosette and the diamond (lozenge)', followed by a series of anonymous potters identified by their styles. A first group, including the potter of the rosette with Doccus, the closely-associated Biracatus and Comitianus, and Birrono, are considered to belong to the second century. The remaining named potters, Attianus (representing a group, with Attianus I, II and III), Atilianus, Capellianus, Lupercus, Augurio, Satto, Diogenus, Marcianus / Sab and Pri, are all attributed to the third century. There are three anonymous 'late' potters, labelled GX1, GX2 and 'the pediment potter' (*le potier au fronton*), and two undated isolated potters, CAT and ORD[, as well as a fairly large number of wholly unclassified sherds and mould fragments. For each potter or group, there are illustrations of moulds, vessels and sherds, followed by a series of the associated figure types, normally separated into humans, animals and abstract decorations – most of these carry a reference to Oswald's figure types, or in the case of some abstract figures, to the George Rogers' series. There is at least one mould illustrated for all but two of the named potters (the Attianus group is well represented, with 22 out of the 65 moulds attributed to named potters), as well as thirteen further anonymous mould fragments. In all, there are some 368 illustrations of moulds or vessels,

about half of which are attributed to named potters, and these are associated with almost five hundred figure types. Generally the illustrations of vessels and moulds are clear and well-executed, while the reproductions of the figure-types are somewhat less precise.

Chapter 4, describing the applied-moulded and other relief decorations, presents mainly the lion's head spouts found on Drag. form 45 (red and black) sigillata mortaria, moulded decorations found on patera handles and similar forms, and applied-mould decorations found on fine ware vessels. In all these cases, there is a selection of vessels or sherds along with some examples of moulds from the site. Gueugnon seems to have been perhaps the most prolific production centre for Drag. 45 mortaria: in his 1996 general paper on the form, Mitard notes that the 62 spout moulds thus far recorded from the site is the record among all the production sites for the form. That number has not increased in this publication however, mainly because 55 of the 62 spout moulds were found in just two deposits, and there seem to have been no further examples found since the 1980s. Nevertheless, since Mitard's 1996 paper includes only distribution maps for the various production sites where Drag. 45s were made, but no illustrations of forms or spouts, the summary provided here of Gueugnon versions of the vessel is very useful. The same can be said of the series of mould-decorated patera handles, accompanied by at least a couple of moulds, one of which is signed. Examples of this usually rare form are known from Lezoux – more than forty, some in red sigillata and some in 'black slip', have been published (Déchelette 1904; Simpson 1957; Vertet 1972; cf Symonds 1992, 10 and note 8) – but this volume contributes twenty-nine examples from Gueugnon, plus a mould for a decorated horizontal 'grip' attached to the side of a bowl like a flange. The last part of the chapter is concerned with elements of applied-relief decorations on beakers, including a series of moulds. As with the decorated sigillata presented in Chapter 3, these are divided into human forms, animals and abstract figures, and they are followed by a small number of other ceramic moulds: one for an oscillum, one for pastry or bread, and one possibly for making pillar-moulded glass vessels.

Chapter 5 illustrates a total of ninety-nine stamps on plain sigillata, plus forty-three stamps or signatures on decorated Drag. 37 sigillata bowls, and a further sixty-seven rosettes on Drag. 46 cups or dishes. The rosettes, Notet asserts, are not the stamps of illiterate potters, but rather part of a tradition for circular stamped designs intended only for the Drag. 46 form (this was obviously an important form made at the site: there are apparently hundreds of examples in the museum reserves). On plain sigillata, there are forty-two distinguishable names, and twenty-two incomplete names; among the readable names, there is some overlap with those found on the decorated bowls, but the latter contribute at least another seventeen names that can be associated with Gueugnon

– most of the names not found on plain sigillata appear in the form of signatures, rather than stamps.

The penultimate chapter is a summary of various scientific analyses relating to ceramic production at Gueugnon, including the archaeomagnetic dating of three of the kilns (report dated 1987), the archaeomagnetic dating of some sherds of sigillata (reported on in 1989), and chemical analysis of the composition of various Gueugnon products. As luck would have it, a small coin hoard was also found in one of the three dated kilns, containing twenty bronze coins of Tetricus dated AD 268–73. Happily, these fit well with the archaeomagnetic dating of 240–75. The archaeomagnetic dating of sherds was apparently rather less successful, although it has contributed various ideas about the re-firing of some sherds which had apparently become debris inside later kiln structures, and it has been suggested that at Gueugnon vessels were fired upright in the kiln, whereas at some earlier kiln sites elsewhere vessels were probably fired upside down. The chemical analysis of Gueugnon fabrics (not dated, but undoubtedly carried out in the 1980s) consists of a dendrogram and a listing of the samples in their grouped order, along with sets of percentages of the eight most common elements (SiO_2 , Al_2O_3 , CaO , Fe_2O_3 , TiO_2 , K_2O , MgO and MnO) for three groupings, the sigillata, the fine wares and the coarse wares (mostly oxidised wares and mortaria). It appears that the sigillata has a significantly higher proportion of lime, compared to the other Gueugnon fabrics. There are no descriptions of the petrology or photographs of fresh breaks.

The brief conclusions include two distribution maps, one for fine wares other than Drag. 45 mortaria, and one for Drag. 45 mortaria (by Mitard), both of which give a general impression of fairly intensive finds of Gueugnon wares within present-day Burgundy, plus some examples found at considerably more distant sites. However, there is no listing of the sites or of publications that contributed to these maps, and so no way of verifying, for example, the Gueugnon products that are associated with Britain, or with Augst in Switzerland. This kind of distribution map is always easy to criticise, however, because it can only be a statement of the author's view at some time before the book was published (in the case of Mitard's map, some time before 1996). A new version based on current knowledge would be bound to look somewhat different, as would a further version undertaken when the work in this book has been absorbed by ceramics researchers working in areas that might have been reached by Gueugnon sigillata and fine wares.

In the first line of this book Jean-Claude Notet makes it clear that in essence this book was ready for publication before 2000 but various circumstances intervened to cause a substantial delay. Much of the material in it dates to the 1980s or earlier. Part of the delay in the early 2000s was caused by waiting for a study of the Drag. 45 mortaria by Mitard that, very sadly, never

arrived, due first to M. Mitard's failure to find a publisher for his work (completed in 2004), and then, following his death in 2005, the failure of others to publish his work posthumously. (He offered the manuscript to the SFECAG in 2003, for publication as a SFECAG supplement, but, after much discussion, it was rejected, mainly because it required too much work to bring the illustrations to a quality acceptable for publication. As a member of the SFECAG administrative committee that took that decision, I have come to feel since then that this was probably the most regrettable decision that the committee has taken since I became a member in 1987. A way should have been found to help M. Mitard to get his work into the public domain). A second cause for delay was the undertaking by Inrap of an evaluation at the Vieux-Fresne site in 2003 which resulted in a paper published in the *Actes* of SFECAG (Delor and Devevey 2004). Notet has included various elements from the 2003 excavations in this volume, most notably the lower two-thirds of fig 59, which is a previously-unpublished colour photograph of nineteen sherds of decorated Drag. 37 sigillata bowls associated with Biracatus-Comitianus.

This book is not a summary of pottery production at Gueugnon. To see amphorae from the site, one needs to consult Laubenheimer and Notet 1986, or Laubenheimer 2003; to see coarse ware mortaria, one needs Pasquet 1996, 101–3. Delor and Devevey 2004 include a couple of further mortarium forms and one apparently local amphora or large two-handled flagon, a variety of other coarse wares, and some sigillata and fine wares that do not appear in this volume. This volume, however, is a good general summary of sigillata and fine ware production at Gueugnon, and for that it is a welcome and important contribution. Gueugnon is an unusual and very interesting production centre that deserves to have a much more comprehensive treatment, covering its entire chronological evolution and the full range of its products and their fabrics, forms and decorations, along with a review of all the kilns (of various types) that have been excavated. At present there is no sign that the impetus will be found to pursue such a study, but this volume represents a significant step towards that goal.

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(Editor's note: The following two Reviews are of publications sent to the Journal by Museum of London Archaeology (MOLA) for review).

Roman London and the Walbrook Stream Crossing: Excavations at 1 Poultry and vicinity, City of London. Parts I and II, J. Hill and P. Rowsome, 2011, MOLA Monograph 37, two volumes, 592 pages with 410 colour and B&W illustrations, 55 tables and CD-ROM with additional data. ISBN 978-1-907586-04-0

Reviewed by Edward Biddulph

Between 1994 and 1996 Museum of London archaeologists excavated the heart of both the Roman and historic cities of London on a scale not seen since the 1950s. Reaching depths of up to 8m below the modern ground level, the archaeologists uncovered a network of Roman streets in the Walbrook valley on the north bank of the Thames, capturing stories of domestic lives, commercial activity, and turbulent times. The discoveries were spectacular, and rightly celebrated in the 'High Street Londinium' exhibition at the Museum of London in 2000. They have already been the subject of a popular book, *Heart of the City* (Rowsome 2000), and now the results have been published formally in a magnificent two-volume monograph set.

Volume 1 presents the stratigraphic sequence at 1 Poultry and neighbouring sites. True to form, the first task for the arriving Roman engineers was to lay out a road; a roadside drain, dated by dendrochronology to AD 47/48, was one of the earliest features in the sequence. The area rapidly built up, and by the AD 50s, domestic properties and shops lined the road. The Boudiccan revolt of AD 60/61 put paid to prosperity and development for ten years or so, but by the late first century, the workshops, inns and shops – including a pottery shop – returned, as properties were built along a new road layout. Huge deposits of pottery and other refuse were dumped to enable the banks of the stream to be developed. The area was destroyed for a second time in a Hadrianic-period fire, but the properties were quickly rebuilt, and occupation continued into the fourth century. Bathhouses and possibly a temple precinct wall were among the latest structures.

Even with the raft of tree-ring and radiocarbon dates pottery, as ever, provides crucial dating evidence. Pottery from *in situ* Boudiccan destruction deposits, however, presents a chronological anomaly, as material such as Highgate Wood C ware and certain later first century samian, which on conventional dating should not have been made before AD 70, was clearly available ten years

earlier. This has important implications for the dating of pottery groups. Should we now routinely date Highgate Wood C ware from AD 60 rather than AD 70, or calibrate the ceramic dates of pottery groups containing the fabric using a calculation based on the estimated lag between use and final deposition? In this way, a grave group that includes a fresh looking Highgate Wood beaker probably not long bought from the pottery shop or merchant before being deposited potentially has an earlier start date than a group of ostensibly contemporaneous domestic waste containing the same type that will have seen years of use before discard. Care must be taken.

Volume 2 offers detailed discussions on significant structural, economic and social aspects of the site, for example evidence for trade and commerce in the mid-first century, recovery after the Boudiccan destruction, ritual and religion in the post-Boudiccan settlement, and the character of the domestic and other buildings. The discussions pull together evidence from the finds and environmental work, as well as the stratigraphic and chronological analyses. Descriptions and analysis of the pottery by Louise Rayner is thus integrated within the overall discussions, and pottery sections are presented throughout the volume. Not every section is standard, however, and some sections provide more detail than others, with the inclusion in some cases of tables of quantification by form or fabric. The volume also contains individual specialist reports as appendices. In the case of the pottery report we get a discussion on the *seria*, an unusual type of large storage jar or dolium, of which at least five were recorded, and catalogues of samian, mortaria and amphorae stamps, and of graffiti.

From a ceramic standpoint, there is much to enjoy in volume 2 as 1 Poultry produced some spectacular assemblages. Redeposited pottery from early Roman Building 11 included a mass of partially complete amphora – among them Dressel 20, Camulodunum 186, and Dressel 2–4 types, having contained olive oil, fish sauce and wine respectively – and a samian assemblage containing surprisingly few decorated bowls but a strong bias towards plates and cups. Given this ceramic profile, and other evidence, such as high-status food waste, the building was plausibly interpreted as a tavern. A very large pottery assemblage of some 3,500 sherds dating to the early second century was recovered from a timber-framed cistern and associated deposits. The assemblage was domestic in character, being dominated by coarse ware bowls and jars, many of which show signs of burning resulting from cooking and food preparation. The early second century, as C.J. Going (1992, 99) observed, is difficult to detect ceramically, so this assemblage provides a crucial snapshot of pottery supply and use in the late Flavian and Trajanic periods. More interesting though is what is absent from the group. There are very few specialised vessels (*tazze*, for example, are entirely absent), and more curiously, there are no samian Drag.

18/31 dishes, with Drag. 18 plates and Drag. 27 cups dominating instead. These are important observations. To have a chance of identifying the function of a room or building, or characterising the sort of activities that may have resulted in the accumulation of a distinctive assemblage, recording absence can be just as useful as recording presence.

It was the distinctive profile of the ceramic assemblage from destruction debris overlying Building 23 that permitted that structure to be identified as a pottery shop. Over 1000 sherds were recovered, but instead of the expected coarse ware bias, the assemblage was dominated by Central Gaulish glazed ware and South Gaulish samian ware. Glazed ware accounted for almost a quarter of the assemblage by EVE and included flagons, beakers and bowls. Over half the assemblage by EVE was samian, and much of this comprised Drag. 29 decorated bowls. Pompeian Red ware dishes and lids and Rhône Valley mortaria were also present in unusual quantity. Evidently the shop catered for the high-end market, which perhaps tells us something about how coarse wares were supplied. Where did urban residents go for their cooking jars if not the high-street pottery shop? A photograph of the shop as reconstructed for the 'High Street Londinium' exhibition, and reproduced in the volume, is a reminder of the value of full quantification and the need to be cautious about first impressions of pottery freshly excavated or preliminary assessments. The photograph shows a stack of amphorae in the corner, but any Roman-period inhabitant looking to buy amphorae of wine would have left empty handed. The shop did not sell them.

So much for selling pottery. How did the inhabitants of 1 Poultry use vessels? The answer is in ways that we might expect, but also that might surprise us. A honey-pot found at the bottom of a cistern in Building 22 may have been used not for honey, but to lift water. A shell-tempered ware storage jar set into the floor of the same building was clearly meant for domestic use (storage?) and intended to be a permanent fixture. Then there is evidence of reuse. A Cam. 186 amphora had had its handle, rim and spike removed, possibly so that it could be used as a drain or sump. Such examples remind us that pottery was essential to the routines of daily life. Pottery was acquired, used, reused and discarded every

day, and the dumps of broken pottery are testament to a settlement that constantly evolved, developed, and even fought, for existence. Indeed, the integrated format of the pottery report, woven as it is through the publication, nicely reflects the integration of pottery into daily life.

But while the report offers us the life and death of pots, the basic function of a pottery report, the presentation of data, is not ignored. There is generous illustration of pottery groups, and descriptions of most major groups are accompanied by tables of quantification. However, the absence of quantification tables for certain important groups, such as the tavern, is curious (how else can groups from other sites be objectively compared with those from 1 Poultry?), and researchers searching for additional quantified data in the appendix or the CD-Rom at the back of volume 1 will be disappointed. The CD-Rom lists ceramic dating evidence for key sequences and tables of samian stamps and decorated samian, but no further quantified data. A basic quantification table of all recorded fabrics is also absent. The database is no doubt available for consultation in the London Archaeological Archive and Research Centre, but why not make it more accessible on the CD-Rom or online? Of course, no report can satisfy or predict all requirements of the pottery researcher – I would have welcomed the publication of samian rubbings on the CD-Rom (just a few conventionally-drawn sherds of decorated samian are published in the volumes) – but digital publication allows so much more data to be disseminated, and it is surely time that all major pottery reports include a digital component.

The digital archive notwithstanding, *Roman London and the Walbrook Stream Crossing* is a tremendous achievement, boosted in no small measure by Louise Rayner's superb pottery report, with its careful recording, insightful observations and abundant illustrations. Pottery is where it belongs: at the heart of the city.

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Roman and Medieval Development South of Cheapside. Excavations at Bow Bells House, City of London, 2005–6, I. Howell, with L. Blackmore, C. Phillpotts and A. Thorp, 2013, Museum of London Archaeology, Archaeology Studies Series 26; 114 pages, 63 figures, 17 tables, ISBN 978-1-907586-17-0 (£15)

Reviewed by Steven Willis

This book reports excavations conducted at Bow Bells House in 2005–6 which revealed Roman and medieval urban occupation on the south side of Cheapside, with the site examined extending southward to Watling Street. Some 28,138 sherds of Roman pottery were recovered weighing 845kg, most of it stratified in Roman contexts and in a good state of preservation. The work was undertaken in advance of development and in line with the principal that only archaeological remains affected by construction be examined (page 3) the excavations were not an open area dig but a series of 80 small areas, most barely 5m² though in sum these amount to a very comprehensive sample of the site (fig 2). Yet whilst the excavations represent a sizable intervention they were nonetheless not of the scale of the work at 1 Poultry (Reviewed above) and this monograph is accordingly less substantial.

In the Roman period the main east–west arterial road of *Londinium* crossed just to the north of the examined area. An early feature encountered was an apparent ‘laying out ditch’ which ran east–west on the north side of the excavated area to the south of this main road. Several features were associated with this ditch, with intensive development occurring *c* AD 60–70 (seemingly therefore more promptly than at 1 Poultry). Evidence of floors, hearths and wall slots is interpreted as the elements of timber buildings fronting on to roads to the north and south of the site. Pitting and large quarry pits, features apparently capped by substantial ‘dump layers’ containing large assemblages of material culture, probably pre-date the previously well-recorded Hadrianic fire (*c* AD 125). This horizon was not directly observed at Bow Bells House, taken to indicate that the area was not otherwise in use then, at least on the Cheapside frontage. Later activity included a masonry building on the Watling Street frontage in the second century. The later picture, from the mid-second century onwards, was limited as levels had been subject to modern truncation. The site was seemingly not reoccupied until the 10th century AD. No medieval ground plans survived but there were indications of at least one building before the 13th century. Subsequent steady development occurred and there is a late 13th / early 14th century assemblage of pottery vessels associated with the wine trade, together with early 14th century kitchenware, from pits and wells.

The site continued to develop until the Great Fire of 1666 when the buildings were destroyed.

The monograph layout and the conventions for plans are consistent with other MOLA reports of recent years and are clear and attractive. A high level of planning and care has gone into producing this volume. Pottery is illustrated via drawings and photographs, often with photos of sherds and fragments integrated into the conventional line drawing of the vessel in a manner that MOLA was amongst the first to pioneer. This approach is effective in conveying form along with vessel surfaces and condition and much of the character of the item is thereby apparent.

The remains of Roman London are extensive and in many ways exceptional; they can be spectacular, though, as elsewhere, often they are fragmentary. Truncated and cut through by the actions of subsequent development all that remains of the earliest layers and features can be very partial. Archaeologists working in the city have become skilled at understanding what small islands of stratification, spreads of brickearth and gravel represent, and in extrapolating from these to elicit the former presence of buildings and other features of the Roman metropolis. Some eleven early Roman buildings are identified in the area from vestigial yet diagnostic evidence (pages 12–4), though of course such structural elements and surfaces held little in the way of pottery remains themselves. Early Roman stratification at Bow Bells House had been particularly subject to removal from the cutting of later features; nonetheless the area is important for the large finds assemblages contained by the various ‘dumped’ layers present (page 18).

Adjacent areas have been subject to previous investigation so something of the context of the surrounding area in Roman times was known (pages 7–8, fig 6) thereby enabling some site elements to be more confidently identified and consistency in elements of the early layout is noted (page 18). Nearby excavations at Paternoster Square, 72–75 Cheapside and 1 Poultry indicated that buildings stood at those sites at the time of the Boudiccan fire. This may have been so at Bow Bells House but direct evidence that this was the case was not found (page 18). Most of the early buildings were apparently constructed in the decade following the fire, as at 72–75 Cheapside, so there was immediate post-destruction investment albeit in the form of modest buildings quite typical of London at the time. Equally at Paternoster Square and 72–75 Cheapside buildings had remained in use till the Hadrianic fire (page 28) with subsequent recovery at both, whereas at Bow Bells House there was less occupation from as early as *c* AD 100 and only a few structures are known after that date (such as Buildings 13 and 15, the latter being a masonry structure on the Watling Street frontage (page 27)) demonstrating that the history of this urban landscape cannot be written from one or two sites alone, for the picture was complex.

The point is made that differences in social status may be discerned 'between the inhabitants on the Watling Street frontage and those on the Cheapside frontage' (page 28).

Early in the sequence at this site a series of 'dumped' deposits seen as probably waste disposal were encountered in the area south of the 'marking-out' ditch (pages 8–9) with material mainly Flavian (page 9). Further south two quarry pits S2 and S3 (page 9) contained large amounts of pottery and other finds, with quarry S2 yielding over 1000 sherds (47.6kg) of mid- to late Flavian date, and much glass dated to *c* AD 60–70. There is a detailed section focused on this large group from S2, where amphorae and other pottery are considered by type (especially unusual or key diagnostic types).

Reporting of the Roman pottery in this monograph takes two forms. On the one hand chronologically significant and typologically interesting individual pottery items and groups are described and discussed in the main text on the structural/stratified sequence, and in some cases are illustrated, such as items from well S6 comprising early Roman types (page 11 and fig 11), a bowl of Romano-British glazed ware with barbotine decoration (fig 18), and late Roman items (page 29); these sections are evidently the work of Amy Thorp. On the other hand there are lengthy sections focused upon the amphorae, graffiti and stamped mortaria. There is no conventional report with quantification tables, with publication of form series or groups and discussion by fabric (*cf* Biddulph's Review of 1 Poultry above) and I am sure it would have proved a helpful asset if at least some basic listings/quantified records had been provided in this printed volume; in contrast the much smaller medieval pottery assemblage (pages 90–5) is reported with explicit quantification by fabric (e.g. table 13). The Roman pottery was spot-dated and archived to Museum of London standards using their Oracle database. These records will be comparatively detailed but I take this to mean that the assemblage overall was not exhaustively quantified. The reason for this is not given, though it can be deduced. Roman pottery from London is now comparatively well understood and hence selection in what is fully studied may be justified. The nature of the excavation trenching, feature types and preservation, as well as budgeting, were probably factors framing the approach. Further, with this particular site the bulk of the pottery was recovered from secondary contexts (pits, quarry holes and wells) and whilst its condition is generally good (page 36) the pottery excavated was not on the whole, it would seem, used and consumed at this location, but came to be deposited here as a convenient place of debris discard from locations of consumption nearby (pages 18 and 37). Perhaps the reasons behind the way the Roman pottery is reported could have been made more explicit.

Of the early Roman buildings more could be discerned of Building 10 fronting on to Watling Street and this

building seems fairly certainly associated with glass-working (pages 14–5). Pottery from pit S11 associated with the building included coarse ware items with secondary burning and exterior residues plus some vitrification and the authors conclude that this indicates their likely use in a stage of the glass manufacturing process (pages 14–5, fig 14).

Pots of interest from well S12 are also itemized with their use in cooking indicated (pages 15–6, fig 15). Examples of Lyon colour-coated ware beaker, cup and lamp forms were present amongst the assemblage (pages 11 and 17–18). London has produced a considerable amount of this imported ware which in Britain seems to have been more regularly supplied to the army and official centres than to the civilian market (Willis 2003) but there is no reason to think this is anything other than civilian consumption in this case. The beaker is of ovoid shape while the lamp, which is from the same context, has 'egg and dot' decoration.

Graffiti are reported by Roger Tomlin (pages 46–8) with five cases of personal or likely personal names on Roman pots/sherds and three of quantity on amphorae, together with an important case of a painted inscription on a London 555/Augst 21 amphora giving a name of a probable shipper and information on vessel content specifying green olives, syrup and a weight, thereby providing information consistent with the pioneering publications of the type by Sealey and Tyers (1989) and Martin-Kilcher (1994). Several pages are devoted to reporting the finds of amphorae, supported by petrological work, which amount to an estimated 1255 vessels which include considerable variety (pages 37–45). The buildings and their associated features encountered at the site yielded comparatively few sherds of amphora and where present these were from the two most common categories: Dressel 20 and Gauloise type. The variety came from the 'dumped deposits' such as those filling S2 and S3 and probably derive from consumption not at this site but nearby. The composition of the assemblage is considered by type. Some 31 examples of London 555 amphorae occur in a variety of fabrics, underscoring the fact that the form was made at a number of locations (page 38). Dressel 2–4 is also well-represented, as, in relative terms, is Dressel 28, though for some reason Rhodian vessels are not present in expected proportion (page 39). Late forms present included a complete Dressel 23 and a Benghazi MR 1. The discussion is taken further with an analysis of what the assemblage means in terms of contents, with the potential for inter-site comparison noted (page 40); this is undertaken by period with a comparison made with a sample from 2–12 Gresham Street (close-by and residential). Graphs show composition though it would be helpful if absolute numbers forming the samples were included.

The Roman pottery section concludes with an annotated catalogue of stamped mortaria by Kay Hartley

(pages 48–51), which is much more than a listing, rather a series of informative essays where the significance of the stamp in question is conveyed, emphasizing the advanced understanding of the workshops and dies at the command of the author, and of the questions still requiring answers.

Beyond the documenting and discussion of the Roman pottery *per se* the archaeology of the site has constituents that can assist us in contextualizing pottery use and the urban environment in and around Bow Bells House in Roman times. An important discovery forthcoming from the excavations was the Roman glass assemblage and evidence for glass working/vessel manufacture at the site (pages 51–7). This reminds us that whilst pottery was a common utensil option of the Roman world there were alternative materials such as glass for storage, serving, status display and specialized function, and these will have been particularly accessible at a large centre such as London; hence consideration of social practice and the use and consumption of material culture needs to take an inclusive view.

Post-Roman pottery is reported by Lyn Blackmore and it is useful to note this material for the perspective it provides in this case. Medieval occupation (AD 900 – 1200) sees an increase in imports after 1000 (page 78). The documentary research of the late Christopher Philippotts examining the later medieval properties, their layout, ownership and usage (and changes there with) raises an informative dimension unavailable to the researcher of the Roman era. The plan of these details (fig 54) shows that across the Bow Bells House site this was a period of densely packed inns, houses, shops and yards (page 79). Part of the commercial hub of medieval/late medieval London with vintners and warehousing,

and with houses becoming taverns and great houses the location of carriers (page 79). This character is reflected in the contemporary pottery assemblage amongst which imported vessels associated with the wine trade and drinking are well represented (pages 94–5). One cannot help thinking that this perhaps more vivid evidence from a later era, of trade and commerce, social interaction and consumption offers a parallel to the Roman era with its imports, dense occupation and evidence of large scale trade in wine and other exotic commodities, even if the latter activities were centred nearby the site dealt with here rather than directly occurring at the Bow Bells House site.

Roman pottery from London has been studied in great detail since the 1970s and this work has often been leading work for the subject as a whole, in terms of typological understanding and in terms of methods. This monograph and other publications of recent years from London, including 1 Poultry, have built upon the legacy of the likes of Marsh, Orton and Tyers from the 1970s and Symonds and Tomber and their colleagues in the 1980s and 1990s (*cf* pages 5 and 35). The good progress and excellent reporting continues!

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Reviewed by Raphael Isserlin

Perhaps few reviews appear more than twenty years after the publication of the volume in question but I am minded to present this short summary, drawing on the publisher's abstract, to raise awareness amongst Roman pottery specialists of relevant artefactual comparanda in base metal. It is commonplace to say that students of Roman ceramics should not confine themselves to the study of pottery alone and indeed parallels in terms of forms and form attributes between pottery vessels and some Roman glass vessels and silverware are familiar; now it is increasingly being realized, some vessel forms may copy forms in bronze, such as cauldrons and casseroles. Here we may note the valuable study by Morten Hegewisch (2005).

Access to a reliable corpus of dated or datable material, however, whence fruitful comparisons may be made, has its own problems (when, all being well, the Drapers' Gardens assemblage from London is published, we may be even better informed: meanwhile see Gerrard 2009) and it is easy to forget, given the dominance of its products in the reportage of pre-Flavian and Flavian Britain, that there were bronze industries other than those in Campania. This publication of a 1989 University of Munich PhD thesis goes some way to bridging that gap; it is a typological, chronological and technological analysis of 738 published vessels and

items in museum collections for the period 20 BC–AD 300 (including British material).

Part 1 of the study presents the author's main arguments, some aspects of which will strike a certain resonance with readers of *JRPS*, namely the rationalization of production using the lathe (that is, comparable to a very fast wheel) for the finishing of raw vessels, rather than embossing on a turntable; or the mid-first century AD relocation of workshops from Campania to Gaul; or the second-century disappearance of manufacturers' stamps as there was 'a relapse into embossed undecorated mass products'. The author's overall chronological *schema* identifies three 'generations' ('stage' or 'period' may be a better word since 'generation' has overtones of working lives): *first stage* c 100–20 BC, *second stage* 20 BC–AD 140, within which there are 3 phases of development (*Phase 1*, c 20 BC–AD 15, *Phase 2*, c AD 15–40, *Phase 3*, c AD 40–140), and *third stage* c AD 140–300. Part 2 consists of a catalogue of all producers with their places of production, products, distribution, technical details and dating. In Part 3, the typological catalogue, find-spot, circumstances of finding, accompanying objects and literature are listed for each vessel. A comparative list with the now out-dated, but still commonly cited, typology of Hans-Jürgen Eggers (whose work on the distribution of Roman artefacts in *Germania Libera* informs much of Sir Mortimer Wheeler's *Rome Beyond the Imperial Frontiers*) and an index round off the study. The text is in German.

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